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ITEM NAME: - "SPRING BASKET" (MACHINING)"

Details of items covered in Bid are as below: -

Item No.	Material Code	MATERIAL DESCRIPTION	Drawing	Qty (Lot Wise)	Delivery Schedule
1.	W90413501183	1 SET COMPRISES OF 7 NO. SPRING BASKET (MACHINING) AS PER DRG NO. 11350401070 VAR00 AS PER DOC NO TDC-M-11350401070 WEIGHT OF 1 NO SPRING BASKET 1716 KG	11350401070 REV: 02	1 (lot 1) 1 (lot 2) 1 (lot 3) 1 (lot 4) 1(lot 5) 1 (lot 6) 1 (lot 7) 1 (lot 8)	30.09.2026 30.11.2026 30.12.2026 28.02.2027 30.04.2027 30.05.2027 30.08.2027 30.09.2027

QUALITY REQUIREMENTS: For 4 no. Quantity (Adani and Koderma Projects)

- **VENDOR APPROVAL FROM END CUSTOMER IS REQUIRED. VENDOR TO SUBMIT CREDENTIALS IN THE ATTACHED FORMAT TO TAKE UP WITH END CUSTOMER FOR APPROVAL.**
  PRE-DISPATCH INSPECTION BY BHEL/BHEL TPIA & END CUSTOMER AS PER BHEL & END CUSTOMER APPROVED QP. VENDOR TO SUBMIT QP FOR BHEL & END CUSTOMER APPROVAL.

QUALITY REQUIREMENTS: For remaining quantity (3no.)

- **PRE-DISPATCH INSPECTION BY BHEL/BHEL TPIA & END CUSTOMER AS PER BHEL & END CUSTOMER APPROVED QP. VENDOR TO SUBMIT QP FOR BHEL & END CUSTOMER APPROVAL.**

Note: - For Mahan Projects (2 no. quantity.), separate painting scheme will be applicable (available in attached documents).

EMD: As per clause 5A.1 & Clause 5B.1 of Amendment no. 04 of Purchase Policy-2013, EMD of Rs. 6 Lacs (refundable) & minimum 5 % Performance Security (form successful bidder) is applicable from bidders for this enquiry. (except Micro and Small Enterprises (MSEs) or Startups as recognized by Department for Promotion of Industry and Internal Trade (DPIIT)).

Reverse Auction (RA):-Price bid to RA shall be conducted for only those bidders who qualifies PQR and whose techno-commercial bid is acceptable to BHEL. RA shall be conducted with option of RA with elimination of H1 bidder in line with BHEL Reverse Auction Guideline (SS&P Circular No. 08 of 2024-25 - RA Guidelines 2024).

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BHEL will reserve the right to inspect/test the material during/after manufacturing at suppliers' works, and/or at BHEL Site. In case of rejection at any stage, Supplier/Vendor shall be liable to replace the materials at his own cost.

Procedure for Bid submission: - Offer shall be submitted by the bidders in two parts
Bid Part - I Technical cum Commercial bid.
Bid Part - II Price bid
Both Part - I & Part - II of the offer to be uploaded on BHEL e-procurement site using Class III digital signature. Bidders to mandatorily put sign and seal on all the uploaded documents. The quotation should be uploaded on the site before due date / time.

Part-I of the bid shall contain complete details of the product offered, PQR qualification, MII certificate, FCA, acceptance to the specification and all techno commercial terms & conditions.

Part – II comprises BOQ/Price bid (GST extra).

Bid opening – Techno commercial bid (Part-I) of the offers shall be opened on the due date of tender opening on e-procurement portal. Clarifications if required on this part may be obtained from the bidders for their evaluation. The Price bid Part-II of such bidders alone shall be opened on a later date on e-procurement portal whose PQR qualification and techno-commercial bids are found acceptable. The date of 'Price bid- Part- II' shall be intimated to technically qualified bidders later.

Pre-qualification Criteria (mandatory for further consideration of offers)
Please note that offers of only those bidders who meet pre-qualification criteria shall be considered. Bidders to submit all supporting documents in compliance with each requirement.

MII preferences shall be proposed to local suppliers as per revised 'Public Procurement (Preference to Make in India), Order, 2017 issued by DPIIT vide OM No. P-45021/2/2017- PP(BE-II) Part (4) Vol. ll dated 19.07.2024 and subsequent order(s).

Bid evaluation: - The bids shall be evaluated on item wise total delivered cost to BHEL considering all duties/taxes/Cess etc. as could be applicable.
NOTE: In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders. In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L1 bidder shall be decided by a toss/draw of lots, in the presence of the respective L1 bidder(s) or their representative(s). Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.

Delivery Period: - Vendor to quote delivery in weeks, quoted delivery period shall be used to place regularizing PO. The material is required at BHEL Haridwar and Bidders shall commit suitable delivery period on **FOR destination basis**. Delivery period in the purchase order shall be as per accepted delivery period quoted by the vendor or required delivery period by BHEL, whichever is later. Bidders may note that delivery beyond committed schedule will attract penalty for delayed performance.

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Guarantee/Warranty certificate and Test Certificate to be provided along with the supply.

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10. Non-Disclosure Agreement

Unregistered vendors at BHEL Haridwar for this item may avail the soft copies of relevant specification / drawing by submitting the endorsed copy of attached 'Non-Disclosure Agreement' to either of the following e-mail IDs:

1. **Virendra Singh-** v_singh@bhel.in
2. **Ghulam Shabbir-** ghulam.shabbir@bhel.in

TECHNO- COMMERCIAL OFFER :

Bid should be free from correction, overwriting, using corrective fluid, etc. Any interlineation, cutting, erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else bid shall be liable for rejection. In the event of any Technical or Commercial queries, the same may please be addressed to the following BHEL concerned e-mail IDs before Part- I opening. -

1. **Virendra Singh-** v_singh@bhel.in
2. **Ghulam Shabbir-** ghulam.shabbir@bhel.in

Bidder to submit Techno- Commercial offer along with bid.

SCOPE OF SUPPLY & PRICE BASIS:

VENDORs TO QUOTE FIX/FIRM RATE WHICH SHOULD BE ON ALL- INCLUSIVE BASIS i.e. LOCAL LEVIES/TRANSPORTATION/LOADING- UNLOADING, P&F CHARGES AND NABL CHARGES ETC. UPTO FOR BHEL- HEEP HARIDWAR.

TRANSIT INSURANCE: BY BHEL.

NO PVC (PRICE VARIATION CLAUSE) SHALL BE CONSIDERED FOR THIS ENQUIRY AND SHALL BE PROCESSED WITH FIX/FIRM RATES i.e. INR/ Pieces.

Taxes & Duties: - Applicable 'GST' shall be extra.

(Note: - vendor to specify the applicable GST percentage; otherwise, 18% will be considered for evaluation purposes)

TAXES AND DUTIES: -

Bidder to inform **% of EXCLUSIVE GST**- _____%

The admissibility of GST, taxes and duties referred in this chapter or elsewhere in the contract shall be limited to direct transactions between BHEL & its Supplier/Vendor. BHEL shall not consider GST on any transaction other than the direct transaction between BHEL & its Supplier/Vendor.

Supplier/Vendor shall obtain prior written consent of BHEL before billing the amount towards such taxes. Where the GST laws permit more than one option or methodology for discharging the liability of tax/levy/duty, BHEL shall have the right to adopt the appropriate one considering the

amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the Supplier/Vendor. Supplier/Vendor has to submit GST registration certificate of the concerned state. Supplier/Vendor also needs to ensure that the submitted GST registration certificate should be in active status during the entire contract period.

Supplier/Vendor has to issue Invoice/Debit Note/Credit Note indicating HSN/SAC code, Description, Value, Rate, applicable tax and other particulars in compliance with the provisions of relevant GST Act and Rules made thereunder.

Supplier/Vendor has to submit GST compliant invoice within the due date of invoice as per GST Law. In case of delay, BHEL reserves the right of denial of GST payment if there occurs any hardship to BHEL in claiming the input thereof. In case of goods, Supplier/Vendor has to provide scan copy of invoice & GR/LR/RR to BHEL before movement of goods starts to enable BHEL to meet its GST related compliances. Special care should be taken in case of month end transactions.

Subject to other provisions of the contract, GST amount claimed in the invoice shall be released on fulfilment of all the following conditions by the Supplier/Vendor: - a) Supply of goods and/or services have been received by BHEL. b) Original Tax Invoice has been submitted to BHEL. c) Supplier/Vendor has submitted all the documents required for processing of bill as per contract/ purchase order/ work order. d) In cases where e-invoicing provision is applicable, Supplier/Vendor is required to submit invoice in compliance with e-invoicing provisions of GST Act and Rules made thereunder. e) Supplier/Vendor has filed all the relevant GST return (e.g. GSTR-1, GSTR-3B, etc.) pertaining to the invoice submitted and submit the proof of such return along with immediate subsequent invoice. In case of final invoice/ bill, contractor has to submit proof of such return within fifteen days from the due date of relevant return. f) Respective invoice has appeared in BHEL's GSTR - 2A for the month corresponding to the month of invoice and in GSTR-2B of the month in which such invoices has been reported by the contractor along with status of ITC availability as "YES" in GSTR-2B. Alternatively, BG of appropriate value may be furnished which shall be valid at least one month beyond the due date of confirmation of relevant payment of GST on GSTN portal or sufficient security is available to adjust the financial impact in case of any default by the Supplier/Vendor. g) Supplier/Vendor has to submit an undertaking confirming the payment of all due GST in respect of invoices pertaining to BHEL.

Any financial loss arises to BHEL on account of failure or delay in submission of any document as per contract/purchase order/work order at the time of submission of Tax invoice to BHEL, shall be deducted from Supplier/Vendor's bill or otherwise as deemed fit.

TDS as applicable under GST law shall be deducted from Supplier/Vendor's bill.

Supplier/Vendor shall comply with the provisions of e-way bill wherever applicable. Further wherever provisions of GST Act permit, all the e-way bills, road permits etc. required for transportation of goods needs to be arranged by the contractor.

Supplier/Vendor shall be solely responsible for discharging his GST liability according to the provisions of GST Law and BHEL will not entertain any claim of GST/interest/penalty or any other liability on account of failure of Supplier/Vendor in complying the provisions of GST Law or discharging the GST liability in a manner laid down thereunder.

In case declaration of any invoice is delayed by the vendor in his GST return or any invoice is subsequently amended/altered/deleted on GSTN portal which results in any adverse financial

implication on BHEL, the financial impact thereof including interest/penalty shall be recovered from the Supplier/Vendor's due payment.
Any denial of input credit to BHEL or arising of any tax liability on BHEL due to non-compliance of GST Law by the Supplier/Vendor in any manner, will be recovered along with liability on account of interest and penalty (if any) from the payments due to the Supplier/Vendor.
In the event of any ambiguity in GST law with respect to availability of input credit of GST charged on the invoice raised by the contractor or with respect to any other matter having impact on BHEL, BHEL's decision shall be final and binding on the Supplier/Vendor

VARIATION IN TAXES & DUTIES:

Any upward variation in GST shall be considered for reimbursement provided supply of goods and services are made within schedule date stipulated in the contract or approved extended schedule for the reason solely attributable to BHEL. However downward variation shall be subject to adjustment as per actual GST applicability. In case the Government imposes any new levy/tax on the output service/goods after price bid opening, the same shall be reimbursed by BHEL at actual. The reimbursement under this clause is restricted to the direct transaction between BHEL and its Supplier/Vendor only and within the contractual delivery period only. In case any new tax/levy/duty etc. becomes applicable after the date of Bidder's offer but before opening of the price Bid, the Bidder/ Supplier/Vendor must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of price bid. Claim for any such impact after opening the price bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

Income Tax: TDS/TCS as applicable under Income Tax Act, 1961 or rules made thereunder shall be deducted/collected from Supplier/Vendor's bill.

Delivery period (in weeks) from PO date: _____

Bidders are requested to quote the best delivery meeting the delivery requirements. BHEL reserves the right to reject the offers not meeting BHEL's delivery requirement.

PAYMENT TERM:

FOR NON MSME Bidders- 100% payment shall be released within 90 days from the date of acknowledged receipt & acceptance of material at HEEP- BHEL stores and submission of billing documents.
FOR MSME Bidders- 100% payment shall be released within 45 days from the date of acknowledged receipt & acceptance of material at HEEP- BHEL stores and submission of billing documents.
FOR MEDIUM ENTERPRISES Bidders, 100% payment shall be released within 60 days upon receipt & acceptance of material at HEEP- BHEL stores and submission of billing documents.
No interest shall be payable on the security deposit or any other money due to the contractor".
MICRO AND SMALL ENTERPRISES (MSE):3 Any Bidder falling under MSE category shall furnish the following details & submit documentary evidence/ Govt. Certificate etc. in support of the same along with their techno-commercial offer.

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Type under MSE	SC/ST owned	Women owned	Others (excluding SC/ ST & Women Owned)
Micro			
Small			

Note: If the bidder does not furnish the above, offer shall be processed construing that the bidder is not falling under MSE category. a) MSE suppliers can avail the intended benefits in respect of the procurements related to the Goods and Services only (Definition of Goods and Services as enumerated by Govt. of India vide Office Memorandum F. No. 21(8)/2011-MA dated 09/11/2016 office of AS & DC, MSME) only if they submit along with the offer, attested copies of either Udyam Registration. Date to be reckoned for determining the deemed validity will be the last date of Technical Bid submission. No benefits shall be applicable for this enquiry if the above required documents are not uploaded at the time of bid submission. Documents submitted by the bidder shall be verified by BHEL for rendering the applicable benefits.

BREACH OF CONTRACT, REMEDIES AND TERMINATION:

The following shall amount to breach of contract: I. Non-supply of material/ non-completion of work by the Supplier/Vendor within scheduled delivery/ completion period as per contract or as extended from time to time.

II. The Supplier/Vendor fails to perform as per the activity schedule and there are sufficient reasons even before expiry of the delivery/ completion period to justify that supplies shall be inordinately delayed beyond contractual delivery/ completion period.

III. The Supplier/Vendor delivers equipment/ material not of the contracted quality.

IV. The Supplier/Vendor fails to replace the defective equipment/ material/ component as per guarantee clause. V. Withdrawal from or abandonment of the work by the Supplier/Vendor before completion as per contract.

VI. Assignment, transfer, subletting of Contract by the Supplier/Vendor without BHEL's written permission resulting in termination of Contract or part thereof by BHEL.

VII. Non-compliance to any contractual condition or any other default attributable to Supplier/Vendor. VIII. Any other reason(s) attributable to Vendor towards failure of performance of contract. In case of breach of contract, BHEL shall have the right to terminate the Purchase Order/ Contract either in whole or in part thereof without any compensation to the Supplier/Vendor.

IX. Any of the declarations furnished by the contractor at the time of bidding and/ or entering into the contract for supply are found untruthful and such declarations were of a nature that could have resulted in non-award of contract to the contractor or could expose BHEL and/ or Owner to adverse consequences, financial or otherwise.

X. Supplier/Vendor is convicted of any offence involving corrupt business practices, antinational activities or any such offence that compromises the business ethics of BHEL, in violation of the Integrity Pact entered into with BHEL has the potential to harm the overall business of BHEL/ Owner.

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Note-Once BHEL considers that a breach of contract has occurred on the part of Supplier/Vendor, BHEL shall notify the Supplier/Vendor by way of notice in this regard. Contractor shall be given an opportunity to rectify the reasons causing the breach of contract within a period of 14 days.
In case the contractor fails to remedy the breach, as mentioned in the notice, to the satisfaction of BHEL, BHEL shall have the right to take recourse to any of the remedial actions available to it under the relevant provisions of contract.

REMEDIES IN CASE OF BREACH OF CONTRACT.

i) Wherein the period as stipulated in the notice issued as mentioned above has expired and Supplier/Vendor has failed to remedy the breach, BHEL will have the right to terminate the contract on the ground of "Breach of Contract" without any further notice to contractor.
ii) Upon termination of contract, BHEL shall be entitled to recover an amount equivalent to 10% of the Contract Value for the damages on account of breach of contract committed by the Supplier/Vendor. This amount shall be recovered by way of cashing the security instruments like performance bank guarantee etc. available with BHEL against the said contract. In case the value of the security instruments available is less than 10% of the contract value, the balance amount shall be recovered from other financial remedies (i.e. available bills of the Supplier/Vendor, retention amount, from the money due to the Supplier/Vendor etc. with BHEL) or the other legal remedies shall be pursued.
iii) wherever the value of security instruments like performance bank guarantee available with BHEL against the said contract is 10% of the contract value or more, such security instruments to the extent of 10% contract value will be cashed. In case no security instruments are available or the value of the security instruments available is less than 10% of the contract value, the 10% of the contract value or the balance amount, as the case may be, will be recovered in all or any of the following manners:
iv) In case the amount recovered under as mentioned above is not sufficient to fulfil the amount recoverable then; a demand notice to deposit the balance amount within 30 days shall be issued to Supplier/Vendor.
v) If Supplier/Vendor fails to deposit the balance amount within the period as prescribed in demand notice, following action shall be taken for recovery of the balance amount:
a) from dues available in the form of Bills payable to defaulted Supplier/Vendor against the same contract. b) If it is not possible to recover the dues available from the same contract or dues are insufficient to meet the recoverable amount, balance amount shall be recovered from any money(s) payable to Supplier/Vendor under any contract with other Units of BHEL including recovery from security deposits or any other deposit available in the form of security instruments of any kind against Security deposit or EMD.
vi) In-case recoveries are not possible with any of the above available options, Legal action shall be initiated for recovery against defaulted supplier/Vendor.
vii) It is an agreed term of contract that this amount shall be a genuine pre-estimate of damages that BHEL would incur in completion of balance contractual obligation of the contract through any other agency and BHEL will not be required to furnish any other evidence to the Supplier/Vendor for the purpose of estimation of damages.
viii) In addition to the above, imposition of liquidated damages, debarment, termination, de-scoping, short-closure, etc., shall be applied as per provisions of the contract.

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Note: 1) The defaulting Supplier/Vendor shall not be eligible for participation in any of the future enquiries floated by BHEL to complete the balance work. The defaulting contractor shall mean and include:
(a) In case defaulted Supplier/Vendor is the Sole Proprietorship Firm, any Sole Proprietorship Firm owned by same Sole Proprietor.
(b) In case defaulted Supplier/Vendor is The Partnership Firm, any firm comprising of same partners/ some of the same partners; or sole proprietorship firm owned by any partner(s) as a sole proprietor.

LD AGAINST DELAY IN EXECUTED SUPPLY IN CASE OF TERMINATION OF CONTRACT:

LD against delay in executed supply shall be calculated in line with LD clause mentioned below, for the delay attributable to Supplier/Vendor. For limiting the maximum value of LD, contract value shall be taken as Executed Value of supply till termination of contract. Method for calculation of "LD against delay in executed supply in case of termination of contract" is given below. i. Let the time period from scheduled date of start of supply till termination of contract excluding the period of Hold (if any) not attributable to contractor = T1
ii. Let the value of executed supply till the time of termination of contract= X iii. Let the Total Executable Value of supply for which inputs/fronts were made available to Supplier/Vendor and were planned for execution till termination of contract = Y iv. Delay in executed supply attributable to Supplier/Vendor i.e. T2=[1-(X/Y)] x T1 v. LD shall be calculated in line with LD clause of the Contract for the delay attributable to Supplier/Vendor taking "X" as Contract Value and "T2" as period of delay attributable to Supplier/Vendor.

LIQUIDATED DAMAGE:

Liquidated Damages, wherever referred under this Tender/Agreement, shall mean and refer to the damages, not in the nature of penalty, which the contractor agrees to pay in the event of delay in delivery of supplies, breach of contract etc. as the case may be. Liquidated Damages leviable upon the Supplier/Vendor is a sum which is agreed by the parties as a reasonable and genuine pre-estimate of damages which will be suffered by BHEL on account of delay/breach on the part of the Supplier/Vendor.
If the Seller/Service Provider fails to deliver any or all of the Goods/Services within the original/re-fixed delivery period(s) specified in the contract/PO, the Buyer/BHEL will be entitled to deduct/recover the Liquidated Damages for the delay, unless covered under Force Majeure conditions aforesaid, @ 0.5% of the contract value of delayed quantity per week or part of the week of delayed period as pre-estimated damages not exceeding 10% of the contract value of delayed quantity without any controversy/dispute of any sort whatsoever.

ACTION AGAINST BIDDERS / VENDOR / SUPPLIER / CONTRACTOR IN CASE OF DEFAULT:

In order to protect the commercial interests of BHEL, BHEL shall act against supplies / contractors by way of suspension of business dealings, who either fail to perform or are in default

without any reasonable cause, cause loss of business/ money/ reputation, indulge in malpractices, cheating, bribery, fraud or any other misconduct or formation of cartels so as to influence the bidding process or influence the price etc.

SUSPENSION OF BUSINESS DEALINGS WITH SUPPLIERS / CONTRACTORS:

The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the banned firms / principal / agents, shall be rejected. The list of banned firms is available on BHEL web site www.bhel.com. If any bidder / supplier / contractor during pre-tendering / tendering / post tendering / award / execution / post-execution stage indulges in any act, including but not limited to, malpractices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or tampers the tendering process or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860(Bhartiya Nyaya Samhita 2023) or any other law in force in India, or does anything which is actionable under the Guidelines for Suspension of Business dealings, action may be taken against such bidder / supplier / contractor as per extant guidelines of the company available on www.bhel.com and / or under applicable legal provisions. Guidelines for suspension of business dealings is available in the webpage: http://www.bhel.com/vender_registration/vender.php.

CONFLICT OF INTEREST:

"A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. The bidder found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

a) they have controlling partner (s) in common; or b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or c) they have the same legal representative/agent for purposes of this bid; or d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; or e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/Assemblies from. one bidding manufacturer in more than one bid; or f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following: 1. The principal manufacturer directly or through one Indian agent on his behalf; and 2. Indian/foreign agent on behalf of only one principal; or g) A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid; or

h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/similar line of business. "

Sign and stamped by bidder

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COMPLIANCE TO RESTRICTIONS UNDER RULE 144 (XI) OF GFR 2017:

I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. The Competent Authority for the purpose of this Clause shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT). II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process. III. "Bidder from a country which shares a land border with India" for the purpose of this Clause means: - a. An entity incorporated established or registered in such a country; or b. A subsidiary of an entity incorporated established or registered in such a country; or c. An entity substantially controlled through entities incorporated, established or registered in such a country; or d. An entity whose beneficial owner is situated in such a country; or e. An Indian (or other) agent of such an entity; or f. A natural person who is a citizen of such a country; or g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above. IV. The beneficial owner for the purpose of (III) above will be as under: 1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together or through one or more juridical person, has a controlling ownership interest or who exercises control through other means. Explanation a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent of shares or capital or profits of the company. b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements. 2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership. 3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person has ownership of or entitlement to more than fifteen percent of the property or capital or profits of the such association or body of individuals. 4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official; 5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership. V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person. Note: (i) The bidder shall provide undertaking for their compliance to this Clause, in the format provided (as attached). (ii)Registration of the bidder with Competent Authority should be valid at the time of submission of bids and at the time of acceptance of the bids.

SETTLEMENT OF DISPUTE:

If any dispute or difference of any kind whatsoever shall arise between BHEL and the Supplier/Vendor, arising out of the contract for the performance of the work whether during the progress of contract termination, abandonment or breach of the contract, it shall in the first place referred to Designated Engineer for amicable resolution by the parties. Designated Engineer (to be nominated by BHEL for settlement of disputes arising out of the contract) who within 60 days after being requested shall give written notice of his decision to the contractor. Save as hereinafter

provided, such decision in respect of every matter so referred shall forthwith be given effect to by the Supplier/Vendor who shall proceed with the work with all due diligence, whether he or BHEL desires to resolve the dispute as hereinafter provided or not. If after the Designated Engineer has given written notice of this decision to the party and no intention to pursue the dispute has been communicated to him by the affected party within 30 days from the receipt of such notice, the said decision shall become final and binding on the parties. In the event the Supplier/Vendor being dissatisfied with any such decision or if amicable settlement cannot be reached then all such disputed issues shall be resolved through conciliation in terms of the BHEL Conciliation Scheme 2018.

CONCILIATION:

Any dispute, difference or controversy of whatever nature howsoever arising under or out of or in relation to this Agreement (including its interpretation) between the Parties, and so notified in writing by either Party to the other Party (the "Dispute") shall, in the first instance, be attempted to be resolved amicably in accordance with the conciliation procedure as per BHEL Conciliation Scheme 2018. The proceedings of Conciliation shall broadly be governed by Part III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and provided in - "Procedure for conduct of conciliation proceedings" (as available in www.bhel.com)).

Note: Ministry of Finance has issued OM reference No. 1/2/24 dated 03.06.2024 regarding "Guidelines for Arbitration and Mediation in Contracts of Domestic Public Procurement. In the said OM it has been recommended that Government departments/ Entities/agencies are to encourage mediation under the Mediation Act. 2023. The said Act has not yet been notified by the Government. Therefore, the clause "Settlement of Disputes" shall be modified accordingly as and when the Mediation Act 2023 gets notified.

ARBITRATION:

Except as provided elsewhere in this Contract, in case Parties are unable to reach amicable settlement (whether by Conciliation to be conducted as provided herein above or otherwise) in respect of any dispute or difference; arising out of the formation, breach, termination, validity or execution of the Contract; 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 (hereinafter referred to as the 'Dispute'), then, either Party may, refer the disputes to Arbitral Institution (e.g. "IIAC" (India International Arbitration Centre) (identified by the contract issuing agency- HEEP- BHEL Haridwar) and such dispute to be adjudicated by Sole Arbitrator appointed in accordance with the Rules of said Arbitral Institution. A party willing to commence arbitration proceeding shall invoke Arbitration Clause by giving notice to the other party in terms of section 21 of the Arbitration & Conciliation Act, 1996 (hereinafter referred to as the 'Notice') before referring the matter to arbitral institution. The Notice shall be addressed to the Head of the Region, Unit, BHEL, executing the Contract and shall contain the particulars of all claims to be referred to arbitration with sufficient detail and shall also indicate the monetary amount of such claim including interest, if any. After expiry of 30 days from the date of receipt of aforesaid notice, the party invoking the Arbitration shall submit that dispute to the Arbitral Institutions (by the contract issuing agency) and that dispute shall be adjudicated in accordance with their respective Arbitration Rules. The matter shall be adjudicated by a Sole Arbitrator who shall necessarily be a Retd Judge having considerable experience in commercial matters to be appointed/nominated by

the respective institution. The cost/expenses pertaining to the said Arbitration shall also be governed in accordance with the Rules of the respective Arbitral Institution. The decision of the party invoking the Arbitration for reference of dispute to a specific Arbitral institution for adjudication of that dispute shall be final and binding on both the parties and shall not be subject to any change thereafter. The institution once selected at the time of invocation of dispute shall remain unchanged.

The fee and expenses shall be borne by the parties as per the Arbitral Institutional rules. The Arbitration proceedings shall be in English language and the seat and venue of Arbitration shall be (identified by the contract issuing agency)- HEEP- BHEL Haridwar. Subject to the above, the provisions of Arbitration & Conciliation Act 1996 and any amendment thereof shall be applicable. All matters relating to this Contract and arising out of invocation of Arbitration clause are subject to the exclusive jurisdiction of the Court(s) situated at HEEP- BHEL Haridwar. Notwithstanding any reference to the Designated Engineer or Conciliation or Arbitration herein, a. the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree. Settlement of Dispute clause cannot be invoked by the Contractor, if the Contract has been mutually closed or 'No Demand Certificate' has been furnished by the Contractor or any Settlement Agreement has been signed between the Employer and the Contractor. It is agreed that Mechanism of resolution of disputes through arbitration shall be available only in the cases where the value of the dispute is less than Rs. 10 Crores. In case the disputed amount (Claim, Counter claim including. interest is Rs. 10 crores and above, the parties shall be within their rights to take recourse to remedies other than Arbitration, as may be available to them under the applicable laws after prior intimation to the other party. Subject to the aforesaid conditions, provisions of the Arbitration and Conciliation Act, 1996 and any statutory modifications or re-enactment thereof as amended from time to time, shall apply to the arbitration proceedings under this clause. In case, multiple arbitrations are invoked (whether sub-judice or arbitral award passed) by any party to under this contract, then the cumulative value of claims (including interest claimed or awarded) in all such arbitrations shall be taken in account while arriving at the total claim in dispute for the subject contract for the purpose. Disputes having cumulative value of less than 10 crores shall be resolved through arbitration and any additional dispute shall be adjudicated by the court of competent jurisdiction.

JURISDICTION:

Subject to as mentioned above of this bid / contract, the Civil Court having original Civil Jurisdiction shall alone have exclusive jurisdiction in regard to all matters in respect of the Contract.

GOVERNING LAWS: The bid / contract shall be governed by the Law for the time being in force in the Republic of India.

FORCE MAJEURE:

"Force Majeure" shall mean circumstance which is: a) beyond control of either of the parties to contract, b) either of the parties could not reasonably have provided against the event before entering into the contract, c) having arisen, either of the parties could not reasonably have avoided or overcome, and d) is not substantially attributable to either of the parties And Prevents the performance of the contract, Such circumstances include but shall not be limited to: i. War, hostilities, invasion, act of foreign enemies. ii. Rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war. iii. Riot, commotion or disorder by persons other than the contractor's personnel and other employees of the contractor and sub-contractors. iv. Strike or

lockout not solely involving the contractor's personnel and other employees of the contractor and sub-contractors. v. Encountering munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the contractor's use of such munitions, explosives, radiation or radio- activity. vi. Natural catastrophes such as earthquake, tsunami, volcanic activity, hurricane or typhoon, flood, fire, cyclones etc. vii. Epidemic, pandemic etc.

The following events are explicitly excluded from Force Majeure and are solely the responsibilities of the non-performing party: a) any strike, work-to-rule action, go-slow or similar labor difficulty (b) late delivery of equipment or material (unless caused by Force Majeure event) and (c) economic hardship.

If either party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within 15 (fifteen) days after the occurrence of such event. The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is prevented, hindered or delayed. The Time for Completion shall be extended by a period of time equal to period of delay caused due to such Force Majeure event. Delay or non-performance by either party hereto caused by the occurrence of any event of Force Majeure shall not v) Constitute a default or breach of the Contract. vi) Give rise to any claim for damages or additional cost expense occasioned thereby, if and to the extent that such delay or non-performance is caused by the occurrence of an event of Force Majeure. BHEL at its discretion may consider short closure of contract after 1 year of imposition of Force Majeure in line with extant guidelines. In any case, Supplier/Vendor cannot consider deemed short-closure after 1 year of imposition of Force Majeure.

CARTEL FORMATION:

The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.

FRAUD PREVENTION POLICY:

Bidder along with its associate /collaborators /sub-contractors /sub-vendors / consultants / service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be in the order below:

a. Amendments/Clarifications/Corrigenda/Errata etc. issued in respect of the tender documents by BHEL.

b. Buyer Added Bid Specific ATC

c. NIC Bid Technical Conditions of Bid/Contract (TCC)

Sign and stamped by bidder

Open Tender Enquiry, terms and conditions

NOTE: 1. In the event of our customer order covering this tender being cancelled /placed on hold /otherwise modified, BHEL would be constrained to accordingly cancel / hold / modify the tender at any stage of execution. 2. BHEL may negotiate the L1 rate, if not meeting our budget / estimated cost. BHEL may re-float the tender opened, if L1 price is not acceptable to BHEL even after negotiation. Any deviation from the conditions specified in TECHNO-COMMERCIAL TERMS AND CONDITIONS, will lead to rejection of offer. 3. Any change in applicable rates of Tax or any other statutory levies (Direct / Indirect) or any new introduction of any levy by means of statute and its corresponding liability for the deliveries beyond the agreed delivery date for reasons not attributable to BHEL will be to vendors account. BHEL will not reimburse the same and any subsequent claim in this respect will be summarily rejected. 4. BHEL reserves its right to reject an offer due to unsatisfactory past performance by the respective Vendor in the execution of any contract to any BHEL project / Unit. 5. The offers of the bidders who are under suspension and also the offers of the bidders, who engage the services of the banned firms /principal/agents, shall be rejected. The list of banned firms is available on BHEL web site www.bhel.com. 6. Recovery / deduction as applicable as per Direct and Indirect taxes as notified by Govt. Of India from time to time will be made and information/certificate for such deduction/recoveries shall be provided by BHEL to the vendor.

Sign and stamped by bidder

PRE-QUALIFICATION REQUIREMENT			
Item: Spring Basket Machined (800 MW) Drg No-11350401070 Matcode (W90413501183)			
	Pre-Qualification Requirement	**Required**	**Offered**
1.0	**Experience:** **1.1** Vendors should have experience of **Fabricating** (cutting/bending/welding etc.) **or Finished machining**, and supplying of atleast 1 no. Assembly in last 15 year from the date of enquiry as per the following details: **(i)** Dimensions of job: LXBXH = 2mtX1.5mtX0.5mt and above. **(ii)** Weight: 1.5Tons and above **1.2** Vendor to furnish certificate or documentary evidence against clause 1.1 from Customer/end user duly confirming that fabricated or machined assembly was supplied and used for Hydro/Thermal/Nuclear Power plant/ Capital goods/ Infrastructure application **OR** **1.3** Vendor to furnish name of customer with complete contact details along with PO copy, type of manufacturing facility used for fabrication (assly/welding/pre-fabrication machining) or machining, supply documents, payment details and inspection documents of supplied fabricated assembly.	Vendor to Comply & submit suitable evidence including technical specifications, drawings etc.	
2.0	**Facility:** **2.1** Vendor should have facilities for at least one of the below set in-house:- **(a)** Fabrication facilities as per Clause 3.1.1 to 3.1.4 of TDC-M-11350401070-00. **(b)** Machining facilities as per Clause 3.2.3 of applicable TDC-M-11350401070-00. **2.2** Vendor has to submit relevant supporting documents for both the cases of in-house facilities and facilities allowed at sub-contractor's/sub-vendors works according to clause 3.0 of TDC-M-11350401070-00.	Vendor to Comply & submit suitable evidence including technical specifications, technical brochure, photographs etc. of the in-house facilities. Or of facilities at sub-vendor works.	
3.0	Vendor to provide clause wise confirmation of the TDC-M-11350401070-00 specification.	Vendor to sign and submit clause wise confirmation of TDC.	
4.0	All PQR documents are to be stamped and signed in original by Vendor. In case documents and official stamp is in language other than English, documents and details of official stamp are to be translated in English and duly certified by Government agency/approved agency of Government/Embassy.	Vendor to Comply & submit suitable documents	
5.0	BHEL reserves the right to visit manufacturing facilities of vendor/vendors who provides relevant documents satisfying PQR Clause 1.0 to 2.0, to verify the information provided. In case the information provided by vendor is found to be false/ incorrect, their offer is lieble to be rejected.	Vendor to provide consent during submission of documents.	

Finish Spring Basket for 800 MW TG as per DRAWING No.11350401070-00

1.0 SCOPE OF SUPPLY:

1.1 **Finish Machined Spring Basket as per drawing no. -11350401070-00:**
Spring Basket (Machining) as per BHEL drawing no. 11350401070 Var 00 with all components including materials as per Combined Bill of Material No. 11350401070 Var 00. It also includes fabrication of following Assemblies:

1.1.1 Spring Basket (welded) as per BHEL drawing no. 11350401071 Var 00 along with all components including materials as per Combined Bill of Material i.e. CBOM no. 11350401071 Var 00. No additional weld joints are allowed (apart from those mentioned in the drawings).

Scope includes procurement of materials, all stage operations including cutting, bending & NDT(RT/DPT/UT) testing during fabrication, pre-fabrication machining of components and also final machining of Spring Basket.

2.0 MATERIAL:

2.1 Material of components shall be as per BHEL specifications given in respective CBOMS mentioned in clause 1.

2.2 Any alternate material from CBOM, if proposed, shall be informed to BHEL along with offer for review. BHEL may accept or reject the alternate material proposal.

2.3 Shot blasted plates/ channels / angles shall be used for fabrication.

2.4 Plates of grade AA10119 above 12mm thickness must be in normalized condition.

3.0 MANUFACTURING REQUIREMENTS

3.1 Fabrication of Spring Basket –

3.1.1. Vendor must have levelled bed plate having size: Length= 4000 mm, Breadth=4000 mm and above to fabricate the job (either levelled machined bed plate or bed plate constructed by steel plates is allowed but concrete floor not allowed).

3.1.2. Vendor works must have EOT crane of 5Tons and above with Sufficient Hook height to suit job requirements.

3.1.3. Vendor must have in-house adequate Heavy Welding & testing facilities/Setup capable of supporting the welding requirements facilities for fabrication of Spring Basket.

3.1.4. Vendor must have in-house cutting facility for MS plate of thickness 70 mm and above.

3.1.5. Vendor must have Suitable pre-fabrication machining facility to fulfill machining requirement of item no 2,3 & 4 of CBOM 11350401071-00 as per drg no. 41350401117, 41350401153, 41350401116 respectively.

3.1.6. In case, Vendor has only Machining facility and subcontracting complete fabrication to sub-vendor or any of the Facility mentioned in cl no 3.1.5 is not available in-house with the vendor and it is sub-contracted by the vendor, the vendor shall furnish details of Sub-Vendor and facilities

available at sub-contractor's works along with offer and get approval from BHEL. BHEL reserves the right for rejection, if the facility is not up to the mark.

3.2. Machining of Spring Basket:

3.2.1 Vendor should have in-house facility for Machining of Spring Basket as per drg no 11350401070-00.

3.2.2 Machining of Spring Basket shall start only after inspection and clearance of Spring Basket (welded) as per drg no 11350401071-00 by BHEL/ BHEL nominated agency.

3.2.3 The vendor shall furnish technical specifications of following machining facilities for machining fabricated Spring Basket available in-house

3.2.3.1 Vendor works must have EOT crane of 5Tons and above with Sufficient Hook height to suit job requirements.

3.2.3.2 CNC Horizontal Boring machine with rotary table of minimum 3.7mx3.7m and proper head travel for machining of Spring Basket.

3.2.3.3 Vertical Boring machine or Vertical Turning Lathe of suitable size and rotary table for machining wit floor size of 3.7mX3.7m and above, with Jaws & Vertical travel 700mm (min).

3.2.4 In case, vendor has only Fabrication facility and subcontracting complete Machining to sub-vendor or any of the Facility mentioned in cl no 3.2.3 is not available in-house with the vendor and it is sub-contracted by the vendor, the vendor shall furnish details of Sub-Vendor and facilities available at sub-contractor's works along with offer and get approval from BHEL. BHEL reserves the right for rejection, if the facility is not up to the mark.

3.2.5 All fasteners and technological shims required during machining are to be arranged by the vendor.

4.0 QUALITY REQUIREMENTS:

4.1 All dimensions and technical requirements as per BHEL drawings/standards are to be complied and recorded by vendor's quality control (QC) and to be submitted to BHEL for acceptance as per agreed stages. Vendor must ensure all technical requirements meets as mentioned in drawings/standards including surface finish, Size & Tolerances, geometrical accuracies, dimension mentioned as critical etc.

4.2 Any non-conformity to any dimension or Technical Requirements of Spring Basket (welded) and Spring Basket (Machining) is to be informed to BHEL on document duly certified by vendor's Quality Control for the approval of BHEL. Vendor shall proceed with the work only after decision given by BHEL on the non-conformity. BHEL reserves the right for rejection of non-conformity and will be final and binding on the vendor.

4.3 Testing as per HW0850199 and all the technical requirements mentioned in the Drawing.

4.4 Manufacturing Plan and Quality Plan is to be submitted to BHEL for approval along with the offer at enquiry stage. BHEL reserves the right to identify customer hold points (CHPs) in Quality Plan which will be

witnessed by BHEL / BHEL nominated agency and beyond which work will not proceed without clearance from BHEL.

4.5 All stage inspections should be followed as per quality plan/assembly requirement and its record should be kept by supplier.

4.6 Painting process and Quality instructions are to be included in Manufacturing and Quality plan.

5.0 QUALIFICATIONS OF MAN POWER:

5.1 Welding shall be carried out by qualified welders as per approved procedure from any of the following third-party agencies Lloyds, TUV, BVQI, EIL and RITES and as per ASME section-IX. Records of qualified welders, WPQ, are to be submitted to BHEL, Haridwar along with the offer.

5.2 NDT (Non-Destructive Test) shall be carried out by personnel qualified by ASNT / ISNT or equivalent. (Minimum Level-II qualified personnel required).

5.3 All the Instruments used for NDT must be Calibrated at the time of usage, with NABL/AERB accredited labs.

6.0 PROCEDURE QUALIFICATION:

6.1 Procedure Qualification Records (PQR) and Welding Procedure Specification (WPS) as per ASME Section-IX, approved from any of the following third-party agencies Lloyds, TUV, BVQI, EIL and RITES, are to be submitted to BHEL along with the offer.

6.2 BHEL approved welding consumables are to be used.

7.0 INSPECTION AT VENDOR'S WORKS:

7.1 Inspection / stage inspection shall be carried out by BHEL / BHEL nominated agency as per approved Quality Plan and drawings.

8.0 PAINTING & CONSERVATION AND IDENTIFICATION:

8.1 After fabrication, Spring Basket is to be thoroughly cleaned to prepare surface for painting by complete removal of rust, spatter, slag, oil / grease spots etc to meet requirements of Sa2.5 & surface profile of 50-60 microns.

8.2 After cleaning internal and external surfaces of Spring Basket are to be coated with one coat of Ethyl Self Curing Zinc Silicate Primer as per IS - 14946 with dry film thickness of 75 microns minimum. Minimum Metallic zinc in dry film must be 75% by weight. All weld seams are not to be painted & are to be protected from any coating.

8.3 After machining all components are to be thoroughly cleaned. There should be no chips inside any pocket of the Spring Basket.

8.4 All machined surfaces are to be suitably protected against rusting, dents, scratches, damage etc during handling at vendor's works and during transit to BHEL.

8.5 All openings / holes are to be plugged by wooded or any suitable material to prevent accumulation of machining chips, dust etc.

8.6 Painting process & Quality instructions as per special instruction of the Indent/PO.

9.0 TEST CERTIFICATES:

9.1 One hard copy and one soft copy of all test certificates like Material test certificates, NDT (Non-Destructive Test) reports, Dimensional reports, Hydraulic & Pneumatic test report, Painting report etc are to be submitted to BHEL for each assembly separately.

DEPTT.	NAME	SIGNATURE	DATE
MTE	Ranjeet Kumar		06/12/24
EMT	Kapil Sharma		05/12/24
WT	Ravi Deshwal	05/12/24	05/12/24
EME	Vishwadeep Gupta	05/12/24	05/12/24

ANNEXURE-I

List of drawings / standards to be referred

1. Drg. No. / CBOM..... 11350401070Var00
   11350401071Var00

2. Material Specification..... As per CBOM
3. Classification of weld Groups..... HW0620099
4. Test Scope..... HW0850199
5. Preservation TG50008

	RECORDS OF CHANGES				
SL. NO.	PARA NO. / ANNEXURE NO.	DOC. NO. / REV. NO.	REISSUE/ REV. NO.	REVISION DATE	NATURE OF CHANGE
1.					

BHARAT HEAVY ELECTRICALS LIMITED

HEEP-HARIDWAR, UTTARAKHAND (249403)

General Instructions and Standard Terms & Conditions for bidding against Tender Enquiry (GISTC)

For Indian Bidders (Version May-2024, Rev: 07)

Table of Contents

1. GENERAL.

These general terms & conditions shall apply to all the Tender Enquiries, notice inviting tenders, request for quotations concerning the supply of goods and / or rendering of services to Bharat Heavy Electricals Ltd., HEEP, Haridwar (hereinafter referred to as BHEL or the Purchaser). In case of placement of order these conditions will become part of Purchase Order (P.O) until unless the deviations are specifically agreed by BHEL.

2. ORIGIN OF QUOTATION.

"A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. **The bidder found to have a conflict of interest shall be disqualified.** A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

a) they have controlling partner (s) in common; **or**
b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; **or**
c) they have the same legal representative/agent for purposes of this bid; **or**
d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; **or**
e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from. one bidding manufacturer in more than one bid; **or**
f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following:
   1. The principal manufacturer directly or through one Indian agent on his behalf; and
   2. Indian/foreign agent on behalf of only one principal;**or**
g) A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid; **or**
h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/similar line of business. "

3. SUBMISSION OF TENDER.

a) Bid / Quotation must be enclosed in sealed cover on which tender enquiry number and the due date MUST BE written and be invariably sent under REGISTERED POST / SPEED POST / COURIER / Dropped in the Tender Box: addressed as follows:

Quotation against Enquiry No._____
Dated: _____
Due on: _____
To,

THE HEAD OF MATERIALS MANAGEMENT,
Heavy Electrical Equipment Plant,
Bharat Heavy Electricals Limited,
HARIDWAR-249403 (Uttarakhand), INDIA.

b) TENDER ROOM is located at: Room No. - 415, 4th Floor, Main Admin. Building, BHEL-HEEP, Haridwar.

c) In case of Three / Two Part Bid, technical bid containing technical offer, duly signed and un-priced copy of the Price Bid should be kept in one envelope. Price Bid containing only the price should be kept in a separate envelope. All envelopes indicating Part-1 or Part-2 or Part-3 as the case may be to be put in a bigger envelope. Please note that un-priced bid should be the exact replica of price bid but without prices.

d) The bid / quotation must be posted before due date, keeping allowance for postal transit time. Quotations sent by any mode but not received in time will be ignored. Tender received through authorized E-mail is also acceptable. However, in time submission of tender in tender box shall be the responsibility of the bidder, sent through any mode. Documents submitted with the offer / bid shall be signed and stamped in each page by authorized representative of the bidder.

e) Any additional documents submitted by supplier / bidder, during processing of registration application / tender or after placement of order shall not be accepted unless it is submitted with forwarding letter and duly signed and stamped.

f) The bids of the bidders who are on the banned list and also the bids of the bidders, who engage the services of the banned firms, shall be rejected. The cutting / overwriting in the bid / offer must be duly attested by the signatories to the bid. The list of firms banned by BHEL is available on BHEL web site www.bhel.com.

g) Being PMD vendor, if you are not quoting against this tender enquiry, please send your regret letter positively for our reference with valid reasons for not participating in the tender enquiry. Repeated lack of response on the part of bidder may lead to deletion such PMD vendor from BHEL's approved vendor list.

h) The bidders will submit Integrity Pact, duly signed by its authorized signatory, along with their bids wherever estimated tender value is Rs. 2 Crore or more.

i) In case of open tender, technically qualified unregistered bidders may apply online for registration through http://www.bhel.com/index.php/vender.

j) BHEL reserves the right to award tendered quantities among more than one bidder (after acceptance of L1 price by the other bidders). BHEL can also consider awarding of part of the tendered quantity to other than L-1 bidder at L1 counter offered rates, if the quantity offered by the L-1 bidder is less than the quantity tendered for.

k) In case of e-Tendering (Online bidding through e-portal), offline bid submitted in hard copy or in any other form by the vendor / supplier will not be accepted and will be rejected out rightly. Only e-portal bid will be accepted.

4. TENDER OPENING.

Tender opening is scheduled to start in the Tender Room at 2:00 PM, on the due date. Therefore, bid / quotations must reach this office / tender Box latest by 1:45 PM on due date. Only participating bidders are allowed to attend tender opening. **TENDERS RECEIVED AFTER THE SPECIFIED TIME OF THEIR 'SUBMISSION' WILL BE TREATED AS LATE TENDERS AND SHALL NOT BE CONSIDERED UNDER ANY CIRCUMSTANCES.** The bidders or their authorized representatives may be allowed to attend tender opening if duly authorized by their principals, through a tender specific letter on that particular day. General authorization letter is not acceptable.

Note: - Foreign bidders willing to attend the bid opening has to provide the requisite documents to the concerned Purchase executives for arranging gate pass for them.

5. SPECIFICATION, DRAWINGS & STANDARD.

a) Bidders must give their detailed specification in the quotation along with relevant technical literature / catalogue etc. against the tender enquiry.

b) The Bid should be accompanied with relevant copies of catalogues, drawings or specification as per tender enquiry.

If these documents are not furnished, the offer is liable to be rejected.

c) Wherever national / international (N/IN) standards are referred, the latest N/IN standards are to be followed. Mention year & date of standard revision that shall be followed for the supply.

d) All Drawings and Standards are proprietary of BHEL. It must not be used in anyway detrimental to the interest of BHEL or without permission of BHEL.

6. PRICE SCHEDULE.

a) Kindly quote your prices in figures and words both. In case of any discrepancy in value, the prices quoted in words shall be considered for evaluation and establishing L1 status.

b) Prices quoted should not be more than the prices quoted to any other BHEL units / offices / divisions. Vendor to submit copy of latest Purchase Order placed by any unit of BHEL for similar items in the technical bid. In case no order has been placed on such items, specific confirmation that no order has been placed on such items should be provided.

c) Prices should be quoted on F.O.R. Destination basis. Transit insurance shall be arranged by BHEL and not to be included in the prices. The offers quoted on other than F.O.R destination basis may result in non-consideration of such bids.

d) In case BHEL accepts the EX-Works prices, such offers will be loaded by 1.5% of EX-Works value towards freight or with actual freight charges as per BHEL freight rate contract whichever is higher.

e) In case of Indigenous items covered by DGS & D Rate Contract, the bidders should submit latest valid copy of the rate contract along with bid / quotation

f) Applicable **IGST / CGST / SGST** and any other statutory levy should be indicated separately and clearly in the bid / quotation.

g) Bidders can dispatch goods through any Indian Bank Association approved transporters having their branch at HARIDWAR / destination. If material is dispatched through other than Indian Bank Association approved transporter, material to be delivered on door delivery BHEL Stores basis.

h) In case of dispatch of material through any other unapproved transporter, payment shall be made only after receipt of material and any additional charges payable to the transporter shall be to the bidder's account.

i) Any demurrage / godown rent payable to the transporter / or to godown's owner due to any delay attributed by the supplier shall be recovered from supplier's account.

j) Currency of Evaluation shall be INR.

NB: Financial evaluation of L1, L2 …..Status will be on the basis of Landed Cost to BHEL.

7. REVERSE AUCTION.

Wherever RA is declared in the special terms and conditions of tender enquiry, following shall be applicable and Bidders to confirm the same:

"BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on www.bhel.com) for this tender. RA shall be conducted among all the techno-commercially qualified bidders.

Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered as initial bids of bidders in RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking."

8. DELIVERY TERMS.

a) Goods shall be delivered on 'FOR Destination' basis to the named destination unless otherwise called for in the tender enquiry.

b) Loading on account of 3rd party inspection charges in case of Indian bidders shall be 0.20%.

9. LIQUIDATED DAMAGES (LD) FOR LATE DELIVERY.

a) Where items of Purchase Order are independently usable.

Liquidated Damages (LD) for Late Deliveries shall be applicable @0.5% per week or part thereof on the value of respective delayed supplies subject to a maximum of 10% of the value of respective delayed supplies. Value of delayed supplies will mean the Gross Value payable to the vendor (Before LD) against such supplies excluding taxes and duties.

b) Where the total items are required for a main equipment and items are interdependent.

Liquidated Damages (LD) for Late Deliveries shall be applicable @0.5% per week or part thereof on total value of Purchase Order subject to maximum of 10% of the total value of Purchase Order. Purchase Order value for this purpose shall be the Total Gross Value payable to the vendor (Before LD) excluding taxes and duties.

c) Bidders are requested to quote the best delivery meeting the delivery requirements. BHEL reserves the right to reject the offers not meeting BHEL's delivery requirement.

d) Commencement of delivery period shall be reckoned from the date of PO / LOI or any other agreed milestone.

e) Bidder shall deliver the goods in the manner and schedule agreed under the terms and conditions of Purchase order.

f) **DELIVERY IN CASE OF REJECTION:** In case the material is rejected, then date of replacement will be considered as the actual date of delivery.

g) **DELIVERY AGAINST BANK DOCUMENTS:** In case payment terms quoted by bidder are documents through bank, and the delivery terms being "FOR Haridwar / FOR Transporter Go-down" then date of delivery will be date of intimation by transporter / bidder of delivery of material at Haridwar for the LD purpose.

h) Where the payments are through bank, the documents may be presented for negotiation to BHEL authorized / nominated bank.

i) Payment of Liquidated Damages (LD) shall not in any way relieve the vendor from any of its obligations & liabilities under the contract.

10. PAYMENT TERMS.

a) BHEL's standard payment term is Payment after receipt and acceptance of materials / items at HEEP, BHEL-Store or at desired destination unless otherwise specified in Special Terms attached to the tender enquiry.

b) BHEL reserves the right to accept or reject the offer of the bidder who quotes the payment term other than BHEL's standard payment term.

c) Loading on account of deviation in payment terms shall be done as per extant rules of BHEL-Haridwar.

d) 100% payment along with taxes, freight & insurance will be made after receipt and acceptance of material and within 75 days from the date of invoice subject to submission of non-discrepant documents within 15 days of supply as per terms and conditions of Purchase Order. In case any discrepancy found in the documents, BHEL will notify the same to vendor within 7 days of receipt. Vendor has to clear all the discrepancies in one go within 7 days thereafter else the payment of vendor may get delayed.

e) For MSEs (covered under MSME Act) which are registered and periodically renewed with BHEL, the payment will be made within 45 days or as prescribed in the relevant act.

f) Adherence to the above time schedule of payment is contingent upon Vendor complying with GST Rules w.r.t availment of Input Tax Credit by BHEL.

g) In case GST credit is delayed / denied to BHEL, due to non / delayed receipt of goods and / or tax invoice or expiry of the timeline prescribed in GST Law for availing such ITC, or any other reason not attributable to BHEL, GST amount shall be recoverable from Vendor along with interest levied / leviable on BHEL.

h) The taxes and duties that are reimbursed would be the ones applicable as on the contractual Purchase order delivery date or the amount actually paid whichever is less.

i) **The loading criteria for the different payment terms shall be as under;**

Payment Terms		Days of Loading
After Receipt & Acceptance of material within 75 days of supply.		**No Loading**
Against Delivery at BHEL-Stores Haridwar.		**45**
Against documents through bank (CAD):		**45**
Letter of Credit (LC)		**120**
Usance LC	No Loading if usance period is > 120 Days.	
	Loading of days' difference i.e. difference between 120 days and usance period if the usance period is < 75 days.	
Advance	Delivery Period + 120 Days - Advance Payment Days.	

11. TAXES & DUTIES.

a) The bidder to specify in their offer (part 1 bid) the category of their registration under GST like Registered, Unregistered and composite dealer.

b) The provisional GST registration number of Bharat Heavy Electrical Ltd, Heavy Electricals Equipment Plant, Ranipur, Haridwar is "05AAACB4146P1ZL" with state Code as "05" and State Name as "Uttarakhand".

c) Please quote our provisional GST registration number in all invoices raised for supply of goods and services under GST regime and also ensure filing of timely return and payment of tax and compliance of other applicable provisions on supplier under GST regime.

d) No GST will be reimbursed to unregistered or composite dealer. In the event, any GST is quoted by composite dealer, the same shall be added to the cost of supply in evaluating the bid.

e) Since, input credit of GST will be available to BHEL-Haridwar only after correct filing of return and payment of applicable GST by supplier, reimbursement of GST shall be made by BHEL-Haridwar on matching of vendor inputs at GST portal, ensuring availability of input credit to BHEL Haridwar. Payment of GST will be made to vendor after matching of input credit and vendor to ensure submission of their invoices along with consent to accept payment of tax after such matching in all cases where bills are submitted directly to BHEL-Haridwar or through bank or under LC or through any other mode.

f) In the event of any disallowance of input credit or applicability of interest or any other financial liability arises on BHEL-Haridwar due to any default of supplier under GST, such implication shall be to supplier's account.

g) In the event of any change in the status of the vendor after the submission of the bid but before the supply, GST applicable at the time of supply or in the bid, based on the registration status of the vendor, whichever is lower shall be payable.

h) Where ever applicable If PAN (Permanent Account Number) of the recipient is not available, income tax is deductible either at the normal rate or at the rate of 20 percent, whichever is higher as per Section 206AA of Indian Income Tax Act 1961.

i) The bidder shall clearly indicate HSN (*Harmonised System Nomenclature)* / SAC (*Service Accounting Code*), its description and applicable rate of GST for each item in his techno-commercial bid.

j) Statutory Variation in Taxes & duties as applicable at the time of supply shall be payable. However, in the event of no change in law but bidder quoting certain tax structure in bid document which is lower than the applicable one, such amount shall be the maximum amount of tax that can be claimed by bidder.

k) **IMPORTED GOODS OFFERED BY INDIAN BIDDERS AGAINST DEALER INVOICE:** Wherever the material being offered is imported, the bidder must quote the prices inclusive of IGST. The rate and value of IGST as included in the price must be indicated separately. In case quantum of IGST is not mentioned by the bidder the same will not be considered for

evaluation. However, bidder will have to pass on the benefit of IGST to BHEL at the time supply.

l) In case of directly dispatchable items to Customer's Site,

BHEL-Haridwar will inform the GST registration number of the respective customer which must be mentioned on the vendor's invoice. Vendor to ensure availability of such information from BHEL-Haridwar before dispatch of any material. However, while filing GSTN-1, BHEL Haridwar GSTN number to be quoted.

Note: - Vendors must ensure compliance of all the applicable rules and procedure as envisaged in the GST Regime. Any loss to BHEL-Haridwar due to fault / non-compliance by the vendor will be to the vendor's account.

12. BANK GUARANTEE.

In case the bank guarantees are required to be deposited towards security deposit/performance guarantee or for any other purpose as per the terms of this tender enquiry, such bank guarantees of the requisite value in the denominated currency of the purchase order should be from one of the Indian branch of BHEL consortium banks and the bank guarantee should be in the proforma as prescribed by BHEL. The proforma of bank guarantee and the list of consortium banks are displayed at BHEL website www.bhelhwr.co.in. However, in case the bank guarantee is not from BHEL consortium banks, then the bidder has to get the bank guarantee confirmed from one of the Indian branch of BHEL consortium banks and the bank charges for such confirmation will be borne by the bidder.

13. GUARANTEE / WARRANTY AND CORRESPONDING REPAIRS / REPLACEMENT OF GOODS.

Goods shall comply with the specifications for material, workmanship and performance. Unless otherwise specified, the warranty shall be for a period of 18 months from the date of receipt. If the delivery is found non-compliant during the warranty period, leading to rejection, the Seller shall arrange free replacement / repair of goods, within one month from the date of intimation or any mutually agreed period. The rejected goods shall be taken away by the Seller at his cost and replaced on Delivered Duty Paid (DDP) (FOR - BHEL Stores / designated destination basis) within such period. In the event of the Seller's failure to comply, Purchaser may take action as appropriate, including Repair / Replenish rejected goods & disposal of rejections, at the risk & cost of the Seller. In case the defects attributable to Seller are detected during processing of the goods at BHEL or at our subcontractor's works, the Seller shall be responsible for free replacement / repair of the goods as required by BHEL.

b) **RETURN OF REJECTED MATERIAL FOR REPLACEMENT:** The bidder shall have to pay 5% incidental charges while taking back supplied material if it is found rejected on receipt. The rejected material shall be sent back only after receipt of replacement / submission of BG / refund of amount paid.

14. QUALITY REQUIREMENT.

Your bid / quotation should have specific confirmation regarding meeting all our quality requirements such as. (i) Test Certificate (TC), (ii) Guarantee Certificate (GC) / Warranty Certificate (WC), (iii) Quality Plan (QP) (if applicable); and (iv) Pre-Dispatch Inspection at your works (if applicable).

15. VALIDITY.

The quotation should be valid for a minimum period of 90 days effective from the date of opening of tender, unless otherwise specified in the tender enquiry.

16. RIGHT OF ACCEPTANCE.

a) **BHARAT HEAVY ELECTRICALS LIMITED HARIDWAR** reserves the right to reject any or all the bids / quotations without assigning any reason thereof. BHEL also reserves the right to increase or decrease the tendered quantities. Bidders should be prepared to accept order for reduced quantity without any extra charges.

b) Any discount / revised offer / bids submitted by a bidder on its own shall be considered, provided it is received on or before the due date and time of offer / bid submission (Part-1). Conditional discounts shall not be considered for evaluation of tenders.

c) Unsolicited discounts / revised offers / bids given after Part-1 bid opening shall not be accepted. No change in price will be permitted within the validity period asked for in the tender enquiry.

d) In case of changes in scope and / or technical specification and / or commercial terms & conditions having price implication, techno-commercially acceptable bidders shall be asked by BHEL to submit the impact of such changes on their price bids. In case a bidder opts to submit revised price bid instead of impact called for then the latest price bid shall prevail. However, in both situations, original price bid will be necessarily opened.

e) The bidder whose bid is technically not accepted will be informed & EMD wherever submitted shall be returned after finalization of contract. EMD shall be forfeited in the event of bidder opting out after tender opening.

f) BHEL reserves the right to short close the existing Purchase Order / Rate Contract / Work Order or any extension thereof at any stage.

17. TRANSIT INSURANCE.

a) Transit Insurance will be covered by BHEL under its open Insurance Policy. Seller shall inform dispatch particulars (Purchase Order, RR /GR, Invoice value etc.) to "Finance department (Store bill Section), BHEL Ranipur, Haridwar (Uttarakhand-India) with value of consignment to the Purchaser within 07 days of dispatch for BHEL to arrange insurance coverage in its policy. Failure on the part of seller to inform dispatch particulars will make him liable to pay for any transit damages / losses suffered by the Purchaser.

b) If Quoted Prices are inclusive of transit insurance, no weightage shall be given while evaluating the bids for Cost of Insurance, being in BHEL Scope.

18. RISK PURCHASE.

In case of abnormal delays (beyond the maximum late delivery period as per LD clause) in supplies / defective supplies or non-fulfillment of any other terms and conditions given in Purchase Order, BHEL may cancel the Purchase Order in full or part thereof, and may also make the purchase of such material from elsewhere / alternative source at the risk and cost of the supplier. BHEL will take all reasonable steps to get the material from alternate source at optimum cost. If bidder does not agree to the above Risk Purchase Clause, BHEL reserves the right to reject the offer. In case for compelling reasons BHEL accepts the offer without acceptance of this clause by the bidder and in the eventuality of Risk Purchase, appropriate action will be taken as per BHEL extant rules. This will be without prejudice to any other right of BHEL under the contract or under General Law.

19. FORCE MAJEURE CLAUSE.

Notwithstanding any other thing contained anywhere else in the contract or PO (Purchase Order), In case the discharge of obligation under the contract by either party is impeded or made unreasonably onerous, neither party shall be considered in breach of the contract to the extent that performance of their respective obligation is prevented by an event of Force Majeure that arises after the effective date (PO date).

In the above clause, Force Majeure means an event beyond the control of the parties to the contract which prevents a party from complying with any obligation of the contract including but not limited to:

a) Act of God (Such as but not limited to earthquake, drought, tidal waves, floods etc.).
b) War (whether war be declared or not), Hostilities Invasion, Act of foreign enemy etc.
c) Rebellion, revolution, insurrection, civil war etc.
d) Contamination of Radio Activity from any nuclear fuel or from any other nuclear waste or any other hazardous materials.
e) Riots, commotions, strike unless restricted to the employees of supplier.
f) Acts of terrorism.

g) Other unforeseeable circumstances beyond the control of the parties and which the affected party cannot avoid even by using its best efforts.
h) Cancellation of contract by customer.
i) Change in law / government. Regulation making the performance impossible.
j) Pandemic or Epidemic.

The party claiming to be affected by force majeure shall notify the other party in writing immediately without delay on the intervention and on the cessation of such circumstances.

Irrespective of any extension of time, if an event of force majeure occurs and its effect continues for more than 180 days the affected party shall have right to cancel the contract.

As soon as reasonably practicable following the date of commencement of a Force Majeure Event, and within a reasonable time following the date of termination of a Force Majeure Event, either Party invoking it shall submit to the other Party reasonable proof of the nature of the Force Majeure Event and of its effect upon the performance of the Party's obligations under this Agreement.

The party shall, and shall ensure that its Subcontractors shall, at all times take all reasonable steps within their respective powers and consistent with Good Operating Practices (but without incurring unreasonable additional costs) to:

a) Prevent Force Majeure Events affecting the performance of the party's obligations under this Agreement.
b) mitigate the effect of any Force Majeure Event and
c) Comply with its obligations under this Agreement.

If the war like situation has developed in a country where a seller's works is located in this P.O. or there is political instability and Indian Embassy located in that country forbids or advises for not having any business dealing with the sellers located in such zone / region/ country, then BHEL reserves the right to cancel the order.

20. 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 or to gain a commercial advantage. BHEL reserves the right to claim damages from the bidder, or take appropriate action as deemed fit against the bidder, for any infringement of the provisions contained herein as available under law or equity.

21. SETTLEMENT OF DISPUTES / ARBITRATION.

In case of any dispute arising out of as in connection with this contract, the same shall be referred to arbitration under Arbitration & Conciliation Act 1996 of a sole arbitrator who shall be appointed by mutual consent of the parties. The seat & venue of arbitration shall be Haridwar.

The proceedings shall be conducted in English. The Governing law of contract shall be the substantive law of India.

22. WHARFAGE / DEMURRAGE RESPONSIBILITY.

In the event of delay in receipt of documents by Manager (Stores-Shipping) BHEL-Haridwar and in case where dispatches are made through Unapproved Transporter the sole responsibility for wharfage / demurrage for such delay shall be that of supplier.

23. CONDITIONS FOR AVAILING MICRO & SMALL ENTERPRISES (MSE'S) BENEFITS.

a) "MSE Suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM II certificate having deemed validity (**five years** from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with attested copy of a CA certificate

(Format enclosed at annexure-1 where deemed validity of EM II certificate of five years has expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two-part bid) or vendor has to give Udyog Adhar Memorandum (UAM). Non submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents is found or the requisite documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above require document are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer." **UAM need not required to be notarized or attested.**

b) Any new supplier will be eligible for registration with BHEL as MSE supplier provided at least any one of the following documents are submitted along with application for registration: -

1. Udyog Adhar Memorandum (UAM).
2. Valid National Small Industries Commission (NSIC) Certificate.
3. Entrepreneurs Memorandum part II (EM II) certificate (valid based on deemed validity of 5 years) or
4. EM II certificate along with attested copy of CA Certificate (as per prescribed format at annexure-A) applicable for the relevant financial year (latest audited), where the deemed validity of EM II is over.
5. However, credentials of all MSE suppliers will be verified before advancing the intended benefits.
6. MSE bidders claiming SC/ST status will have to submit SC/ST certificate of the Proprietor from competent authority. Attested (notarized or attested by Gazetted officer) copy to be submitted along with the offer.
7. In case techno-commercial accepted bidders include MSE source and their prices (based on landed cost – considering quoted prices) are within the price band of 15% w.r.t. L-1 bidder, then BHEL can offer **25%** of quantity of respective item (rounded off to nearest number) to MSE bidders at L-1 price and in case, more than one MSE bidder is in 15 % band and the same is accepted by more than one MSE bidders then **25%** quantities of respective items will be considered for ordering on proportionate basis amongst MSE bidders.
8. There will be minimum of **3%** reservation for women owned MSEs within the above mentioned 25% reservation.
9. The reservation for MSEs owned by SC/ST will be **6.25% {** 25% out of target of 25% - refer para 4 of Public Procurement Policy for the Micro and Small Enterprises(MSEs)}.
10. The definition of MSEs owned by Women Entrepreneurs is clarified as under:
    a) In case of proprietary MSE, proprietor shall be Woman.
    b) In case of partnership MSE, the Woman partners shall be holding at least 51% of share in the unit.
    c) In case of Private Limited companies, at least 51% share shall be held by Women promoters.
11. The definition of MSEs owned by SC/ST is clarified as under:
    a) In case of proprietary MSE, proprietor(s) shall be SC/ST.
    b) In case of partnership MSE, the SC/ST partners shall be holding at least 51% of shares in the unit.
    c) In case of Private Limited companies, at least 51% share shall be held by SC/ST promoters.
12. While distributing the **25%** quantity amongst MSE bidders the decimal points in quantity shall be ignored for all the bidders except the L-1 amongst MSE bidders. Balance quantity after allocating the quantity to other MSE bidders ignoring the quantities in decimal, shall be given to L-1 (amongst MSE) bidder. However, if there are more than one MSE bidder at the same price level than preference for additional quantities due to ignoring off the decimal (as mentioned above) shall be given to the bidder offering favorable terms to BHEL and if the conditions offered are also same then preference will be given to the bidder having high SPR rating.
13. In case there are more than one MSE bidders (with different landed cost to BHEL) within 15% price band of lowest bidder and quantity to be offered is 1 no. only, then preference shall be given to the MSE bidder with lowest landed cost.
14. In case there are more than one MSE bidders (with same landed cost to BHEL) within 15% price band of lowest bidder and quantity to be offered is 1 no. only, then preference shall be given first, based on the favorable terms in the bid and in case terms are also same, the bidder with high SPR rating shall be given preference.
15. If L1 bidder is MSE bidder, entire quantity will be given to such MSE bidder only.

16. Note: It may however be noted that MSE guidelines as on date (Date of Technical Bid Opening Part-1) shall prevail.
17. "As per the OM No. F.No. 1(2)(1)/2016-MA dtd. 09.02.2017 issued from the Office of Development Commissioner (Micro, Small & Medium Enterprises), "Traders and agents should not be allowed to avail the benefits extended under the PP Policy."

In view of this, it is clarified that benefits of MSE (such as EMD Waiver, Tender fee exemption, Price preference, Payment preference etc.) will be given only to those MSE Vendors who are manufacturers of offered items against the NIT. No MSE benefits shall be provided to Agents / Stockists / Dealers / Traders etc. for the items offered but not manufactured by themselves."

24. INFORMATION TO THE BIDDERS.

a) Purchase related information is available at our Business-to-Business (B2B) Portal available on our website https://hwr.bhel.com. The user ID & password can be obtained by sending a request to concerned purchase executives.

b) Intimate your change in mail address or communication address or changes, if any, by email to AGM (SDX/MM) giving your bidder Code.

c) Please resolve your rejections and unexecuted overdue purchase order immediately which are posted at our B2B Portal, which can be visited through our site https://hwr.bhel.com

d) Copy of this Tender Enquiry is being sent through the post.

e) The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
In case, the bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.

f) Supplier must upload digitally signed e-Invoice on B2B portal for processing of Bills.
In other cases, inked signed hard copy of Invoice to be submitted for processing of Bills.

25. MAKE IN INDIA (GOVT-NOTIFICATION).

A. This tender enquiry shall be governed by notification no. P-45021/2/2017-PP (BE-II) dated 04.06.2020 of government of INDIA and subsequent circulars issued afterwards. Accordingly, the minimum local content, the margin of purchase preference and the procedure for preference to make in INDIA shall be adhered.

B. The margin of purchase preference shall be 20%.

- 'Class-I local Supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content equal to or more than 50%, as defined under this order.
- 'Class-II local Supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content more than 20% but less than 50%, as defined under this order.
- 'Non- local Supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content less than or equal to 20%, as defined under this order.

C. Vendor to specifically confirm if they are Class-I or Class-II local supplier or not as per above mentioned notification.
Accordingly, the 'Class-I local supplier'/ 'Class-II local Supplier' at the time of tender, bidding or solicitation shall be required to indicate percentage of local content and provide self-certification that the item offered meets the local content requirement for 'Class-I local supplier'/ 'Class-II local Supplier', as the case may be. They shall also give details of the location(s) at which the local value addition is made.

D. In cases of Procurement for a Value in Excess of Rs. 10 Crores, the 'Class-I local supplier'/ 'Class-II local Supplier' shall be required to provide a Certificate from the Statutory Auditor or Cost Auditor of the Company (in the case of companies) or from a practicing Cost Accountant or practicing Chartered Accountant (in respect of suppliers other than companies) giving the percentage of Local Content.

E. Requirement of Purchase Preference:

Purchase preference shall be given to 'Class-I local supplier' in procurements undertaken by procuring entities in the manner specified hereunder -

a. In the procurements of goods or works, which are covered by para 3(b) of mentioned Govt. circular and which are divisible in nature, the 'class-I local supplier' shall get purchase preference over 'Class-II supplier' as well as 'Non-local supplier', as per following procedure:

i. Among All qualified bids, the lowest bid will be termed as L1. If L1 is 'Class-I local supplier', the contract for full quantity will be awarded to L1.

ii. If L1 bid is not a 'Class-I local supplier', 50% of the order quantity shall be awarded to L1.

Thereafter, the lowest bidder among the 'Class-I local supplier' will be invited to match the L1 price for the remaining 50% quantity subject to the class-I local supplier's quoted price falling within the margin of purchase preference, and contract for that quantity shall be awarded to such 'Class-I local supplier' subject to matching the L1 price. In case such lowest eligible 'Class-I local supplier' fails to match the L1 price or accepts less than the offered quantity, the next higher 'Class-I local supplier' within the margin of purchase preference shall be invited to match the L1 price for remaining quantity and so on, and contract shall be awarded accordingly. In case some quantity is still left uncovered on Class-I local supplier, then such balance quantity may also be ordered on the L1 bidder".

b. In the procurements of goods or works, which are covered by para 3(b) of mentioned Govt. circular and which are not divisible in nature, and in procurement of services where the bid is evaluated on price alone, the 'class-I local supplier' shall get purchase preference over 'Class-II supplier' as well as 'Non-local supplier', as per following procedure:

i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is 'Class-I local supplier', the contract will be awarded to L1.

ii. If L1 is not 'Class-I local supplier', the lowest bidder among the 'Class-I local supplier', will be invited to match the L1 price subject to Class-I local supplier's quoted price falling within the margin of purchase preference, and the contract shall be awarded to such 'Class-I local supplier' subject to matching the L1 price.

iii. In case such lowest eligible 'Class-I local supplier', fails to match the L1 price, the 'Class-I local supplier' with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on and contract shall be awarded accordingly. In case none of the 'Class-I local supplier' within the margin of purchase preference matches the L1 prices, the contract may be awarded to the L1 bidder.

c. 'Class-II local supplier' will not get purchase preference in any procurement, undertaken by procuring entities.

F. For this procurement, the local content to categorize a supplier as a Class-I local supplier/ Class-II local supplier/ Non-local supplier and purchase preference to Class-I local supplier, is as defined in Public Procurement (Preference to Make in India), Order 2017 dated 04.06.2020 issued by DPIIT. In case of subsequent orders issued by nodal ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT.

G. Procurements where estimated value to be procured is less than Rs. 5 lakhs shall be exempted from GOI order No. P-45021/2/2017-PP (BE-II) dated 04.06.2020.

H. For procurement of Goods & Services which are divisible in nature, following shall be operated for **MSE bidders** under Public procurement Policy for the Micro and Small Enterprises (MSEs) Amendment Order, 2019, Ref. No. AA: SSP: MSE: Amndt, dtd. 30.11.2018, Circular No. 44 of 2018-19;-

a. If L1 bid is not from "Class-I local Supplier" and price quoted by MSE bidder falls within the margin of Purchase preference (L1+15% for MSEs), then 25 % of total order quantity of respective item (rounded off to nearest number) shall be awarded to MSE bidder, subject to MSE bidder matching the L1 Price. Out of Remaining 75% quantity, distribution shall be operated as per below sub-clause (2) –

b. If "Class- I Local Supplier" (Next to L1, other than MSE) quoted price falling within the Margin of Purchase Preference, and "Class-I local supplier" matches the L1 price,

then 50% of remaining Quantity (after allocation of 25% to MSE) i.e. 37.5% shall be awarded to local supplier and 37.5% shall be awarded to foreign bidder.

Note: L1 Price refers to lowest evaluated / landed cost to Company.

For Further details, please refer GOI order no. P-45021 / 2 / 2017 - PP (BE-II) dated 04.06.2020.

26. RESTRICTIONS UNDER RULE 144(XI) OF THE GENERAL FINANCIAL RULES (GFRs), 2017

All provisions of Order No. F.No.6/18/2019-PPD of Department of Expenditure (DoE) shall be applicable for this tender enquiry (Order copy is available at **https://doe.gov.in/procurement-policy-divisions)**. Accordingly, any bidder from a country which shares a land border with India (except the countries to which the Govt. of India has extended lines of credit or in which the Govt. of India is engaged in development projects for which list is available at **https://www.mea.gov.in/)** will be eligible to bid in this tender only if the bidder is registered with the Competent Authority as specified in Annex I of the said Order of DoE.

Updated list of the countries to which lines of credit have been extended or in which development projects are undertaken are available on the Ministry of External affairs website **(https://www.mea.gov.in/)**

For the purpose of this order, definition of Bidder from a country which shares a land border with India shall be same as defined in the Annex III of the said order.

Registration with the competent authority as stipulated in the said order is responsibility of bidder. Bidder has to submit a certificate certifying following along with offer:

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India;

I certify that bidder (…. Name of Bidder) is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that bidder (…..Name of bidder) fulfils all requirements in this regard and is eligible to be considered"

If the bidder is from such country which shares a land border with India evidence of valid registration by the Competent Authority shall also be attached along with offer."

27. NOTE.

a) Special conditions of enquiry, if enclosed by BHEL, will supersede the respective standard / general terms of enquiry.

b) Any other Standard terms and Conditions of the bidder attached / referred against the tender enquiry will be treated as null and void ab initio.

c) In order to protect the commercial interests of BHEL, it becomes necessary to take action against suppliers / contractors by way of suspension of business dealings, who either fail to perform or are in default without any reasonable cause, cause loss of business / money / reputation, indulged in malpractices, cheating, bribery, fraud or any other misconducts or formation of cartel so as to influence the biding process or influence the price etc. Guide-lines for Suspension of Business Dealings with Suppliers / Contractors shall prevail over which is available at BHEL website http://www.bhel.com

d) The bidder along with its associate / collaborators / sub-contractors / sub-vendors / consultants / service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL-Management about any fraud or suspected fraud as soon as it comes to their notice.

e) "BHEL shall recover the amount of compensation paid to victim(s) by BHEL towards loss of life / permanent disability due to an accident which is attributable to the negligence of contractor, agency or firm or any of its employees as detailed below;

1. **Victim:** Any person who suffers permanent disablement or dies in an accident as defined below.

2. **Accident:** Any death or permanent disability resulting solely and directly from any unintended and unforeseen injurious

occurrence caused during the manufacturing / operation and works incidental thereto at BHEL factories/ **offices and precincts** thereof , project execution , erection and commissioning, services, repairs and maintenance, trouble shooting, serving , overhaul, renovation and retrofitting , trial operation, performance guarantee testing undertaken by the company or during any works / during working at BHEL Units/ Offices/ townships and premises/ project sites.

3. **Compensation in respect of each of the victims:**

(i) In the event of death or **permanent disability** resulting from **Loss of both limbs:** Rs. 10,00,000/-(Rs. Ten Lakh).

(ii) In the event of **other permanent disability**: Rs. 7,00,000/-(Rs. Seven Lakh).

4. Permanent Disablement: A disablement that is classified as a permanent total disablement under the proviso to Section 2(I) of the Employees Compensation Act, 1923."

f) The bidder shall be in compliance with applicable laws, rules and regulations throughout the terms of the contract for conducting its business generally and to perform its obligations under this contract.

COMPLIANCE SHEET FOR TECHNICAL/COMMERCIAL TERMS AND CONDITIONS as per GISTC

Quotation against Enquiry No._____ Dated: _____ Due on: _____

BHEL Standard Terms	Vendor's Acceptance
1. Payment terms: a) Payment term should be **100% payment After Receipt & Acceptance of Material** at HEEP, BHEL-Store. Bank Charges shall be Not Applicable. b) 100% payment along with taxes, freight & insurance will be made after receipt and acceptance of material and within 75 days from the date of invoice subject to submission of non-discrepant documents within 15 days of supply as per terms and conditions of Purchase Order. In case any discrepancy found in the documents, BHEL will notify the same to vendor within 7 days of receipt. Vendor has to clear all the discrepancies in one go within 7 days thereafter else the payment of vendor may get delayed. c) BHEL reserves the right to accept or reject the offer of the bidder who quotes the payment term other than BHEL's standard payment term. d) Loading on account of deviation in payment terms shall be done as per extant rules of BHEL-Haridwar on bidder's offered prices. The loading criteria for the different payment terms shall be as per BHEL's GISTC (**General Instructions and Standard Terms & Conditions).**	
2. TAXES & DUTIES: Applicable taxes and duties during the dispatch of material.	
i. Rate of GST (Exclusive)	
ii. Input Tax Credit Shall be available	
iii. Any Other Duty:	
3. Packing Charges shall be included in quoted rates.	
4. Forwarding Charges shall be included in quoted rates.	
5. Delivery basis: On "FOR BHEL Haridwar" Basis & Freight charges shall be inclusive in quoted rates.	
6. Delivery Period: Delivery period should be as per tender requirement.	
7. Dispatch of Material: Items should be dispatched through BHEL approved transporters, however Indian bank approved transporters having their branch at Hardwar (details available at www.bhelhwr.co.in) may be considered for dispatch of material. However, in case dispatch through IBA approved transporter demurrage/any other charges shall be borne by supplier. In case dispatch made through un-approved transporters payment shall be made after receipt & acceptance of material only and demurrage/any other charges shall be borne by supplier.	
8. Transit Insurance Transit insurance will be arranged by BHEL for which immediate intimation of dispatch is required as indicated in purchase order. Please send your offer keeping this in view.	

BHEL Standard Terms	Vendor's Acceptance
9. Late delivery penalty Clause: • Liquidated Damages (LD) for Late Deliveries shall be applicable @0.5% per week or part thereof on the value of respective delayed supplies subject to a maximum of 10% of the value of respective delayed supplies. Value of delayed supplies will mean the Gross Value payable to the vendor (Before LD) against such supplies excluding taxes and duties. • Date of Receipt of material at BHEL Haridwar Shall be treated as date of delivery for penalty purpose. • In case of non –acceptance, BHEL may load maximum penalty under LD clause (10 %), to the extent the same is not agreed by the vendor, for the purpose of comparative statement. Where deliveries quoted by the vendor are not suiting, BHEL may also ignore the offer of the vendor.	
10. Force Majeure. Bidder to confirm that they have read the force majeure clause as per BHEL's GISTC and acceptable to them. If bidder does not agree to the said force majeure Clause in GISTC, BHEL reserves the right to reject the offer.	
11. Offer Validity: Validity of the offer should be minimum 120 days from tender opening date.	
12. Deviation Confirm that there is no deviation with respect to BHEL Specifications. However, deviations, if any, are to be listed as a separate attachment. The offers that do not meet the substantial requirements of our enquiry are liable to be ignored. The bidders shall be deemed to comply with all the requirements of bidding documents except for listed deviations without any extra cost irrespective of any mention to the contrary anywhere else in the bid.	
13. Firm & Fixed Price Please confirm that prices shall be firm and fixed till execution of contract. Please note that no revision in the prices or submission of supplementary price bid will be allowed during the validity of the offer. However, if there is any change by BHEL w.r.t. original specifications/ requirement/ scope/terms and conditions, the bidders may be asked by BHEL to submit only the price impact bid for such changes only.	
14. Origin of Quotation: The quotation should be from the principal/original supplier even if it is submitted through their authorized agents, failing which the quotation is liable to be ignored. Also, the name of principal supplier should be indicated on envelop in addition to Enquiry no and due date.	
15. Settlement of dispute / Arbitration: The seat & venue of arbitration shall be as per BHEL's GISTC.	

BHEL Standard Terms	Vendor's Acceptance
16. Breach of contract: - Please confirm that in case of breach of contract, recovery of an amount equivalent to 10% of the contract value shall be done from your pending bills etc.	
17. Test Certificates: Vendor to submit detailed clause wise Test Certificates (TCs) as per BHEL specifications along with dispatch documents at the time of delivery.	
18. Documents requirement confirmation: Vendor to submit following documents along with their offer for faster processing of case: - 1. Dully filled PQR Sheet (Annexure-A) along with required documents 2. Detailed technical Offer. 3. Duly endorsed copy of BHEL GISTC Rev-07. 4. Duly filled and endorsed compliance sheet (Annexure-C). 5. Integrity Pact (IP) 6. Filled in and signed NTPC sub-vendor questionnaire along with supporting documents **Note: Attach separate sheet for additional information if necessary. The above terms & condition supersedes the terms & conditions found contradictory written elsewhere in the tender enquiry and offer of bidder.** Vendors are requested to comment on each applicable clause and write as "NA" if not applicable. Please attach this sheet with your techno-commercial offer. **Signature with stamp**	

DECLARATION REGARDING MINIMUM LOCAL CONTENT IN LINE WITH REVISED 'PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA), ORDER, 2017 ISSUED BY DPIIT VIDE OM NO. P-45021/2/2017-PP(BE-II) PART (4) VOL. II DATED 19.07.2024 AND SUBSEQUENT ORDER(s)

(To be typed and submitted in the Letter Head of the Entity/Firm providing certificate as applicable)

To,

(Write Name & Address of Officer of BHEL inviting the Tender)

Dear Sir,

Sub: Declaration reg. minimum local content in line with Revised 'Public Procurement (Preference to Make in India), Order, 2017 issued by DPIIT vide OM No. P-45021/2/2017-PP(BE-II) Part (4) Vol. II dated 19.07.2024 and subsequent order(s).

Ref: 1) Enquiry No: ……
2) All other pertinent issues till date

We hereby certify that the items/works/services offered by…… (specify the name of the organization here) has a local content of _____ % and this meets the local content requirement for **'Class-I local supplier'** / **'Class II local supplier' **** as defined in Revised 'Public Procurement (Preference to Make in India), Order, 2017 issued by DPIIT vide OM No. P-45021/2/2017-PP(BE-II) Part (4) Vol. II dated 19.07.2024 and subsequent order(s).

The details of the location(s) at which the local value addition is made are as follows:

1. _____ 2. _____

3. _____ 4. _____

Thanking you,
Yours faithfully,

(Signature, Date & Seal of Authorized Signatory of the Bidder)

****** - Strike out whichever is not applicable.

Note:

1. Bidders to note that above format, duly filled & signed by authorized signatory, shall be submitted along with the techno-commercial offer.
2. In case the bidder's quoted value is in excess of Rs. 10 crores, the authorized signatory for this declaration shall necessarily be the statutory auditor or cost auditor of the company (in the case of companies) or a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies).
3. In the event of false declaration, actions as per the above order and as per BHEL Guidelines shall be initiated against the bidder.

MANUFACTURER'S NAME AND ADDRESS		QUALITY PLAN				TO BE FILLED BY BHEL	TO BE FILLED BY BHEL
BHEL	VENDOR'S NAME	ITEM		QP NO.			
				REV			
		DRG. NO.	AS PER PO				
		SPEC.	AS PER PO				
		REV		Page 1 of 1			

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS		AGENCY			REMARKS
										M	B	N	
1	2	3	4	5	6	7	8	9	D	10			11

		LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION	FOR CUSTOMER USE	
MANUFACTURER/SUBCONTRACTOR		ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		APPROVED BY

HEEP, Haridwar

BILL OF MATERIAL

Printed On:29.04.2025

BOM No: 11350401070 **Var:** 00 **Revno:** 7 **Rev Date:** 24.05.2024 **Printed By:**

Description: SPRING BASKET (MACHINING) **Tot wt:** 1716.0

Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / GRP	Weight / Fab Wt
0 1(1) MF DR	11350401070 00 SPRING BASKET (MACHINING)		N	1716.0
1 1(1) MF DR	11350401071 00 SPRING BASKET (WELDED)		N	1830.0
1-1 4(4) MF DR	31350401240 00 HALF RING	HW1041801890	AA10401	316.7
1-2 3(3) MF DR	41350401117 00 00 PLATE	AA1041801246	AA10401 CBOM01350401073	112.0
1-3 4(4) MF DR	41350401153 00 00 TENSION BAR	AA1010209264	AA10109	27.0
1-4 9(9) MF DR	41350401116 00 00 PIPE	HW1041055730	AA10455 CBOM01350401073	10.0
1-5 4(4) MF DR	 PLATE 20X80X200 ST-FE410 WB-PLATE	AA1011819139	AA10119	2.512
1-6 4(4) MF DR	 PLATE 5X80X55 ST-A(FE410 WA)PLATE	AA1011808013	AA10108 TECHNOLOGICAL	0.173

	ENGG Initial	Date
Worked By	tgeam	24.01.2007
Checked By	tgeam	24.01.2007
Approved By	tgerk	06.02.2007

HEEP, Haridwar

BILL OF MATERIAL

Printed On:29.04.2025

BOM No: 11350401071 **Var:** 00 **Revno:** 7 **Rev Date:** 24.05.2024 **Printed By:**

Description: SPRING BASKET (WELDED) **Tot wt:** 1830.0

Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / GRP	Weight / Fab Wt
0 1(1) MF DR	11350401071 00 SPRING BASKET (WELDED)		N	1830.0
1 4(4) MF DR	31350401240 00 HALF RING	HW1041801890	AA10401	316.7
2 3(3) MF DR	41350401117 00 00 PLATE	AA1041801246	AA10401 CBOM01350401073	112.0
3 4(4) MF DR	41350401153 00 00 TENSION BAR	AA1010209264	AA10109	27.0
4 9(9) MF DR	41350401116 00 00 PIPE	HW1041055730	AA10455 CBOM01350401073	10.0
5 4(4) MF DR	 PLATE 20X80X200 ST-FE410 WB-PLATE	AA1011819139	AA10119	2.512
6 4(4) MF DR	 PLATE 5X80X55 ST-A(FE410 WA)PLATE	AA1011808013	AA10108 TECHNOLOGICAL	0.173

	ENGG	
	Initial	Date
Worked By	tgeam	24.01.2007
Checked By	tgeam	24.01.2007
Approved By	tgerk	06.02.2007

BASED ON FV100014e

INSTRUCTIONS FOR PRESERVATION AND PAINTING OF TURBO-GENERATORS

PRODUCT : TURBO-GENERATORS
EXCITERS
AUXILIARY EQUIPMENTS

				नाम NAME	हस्ताक्षर एवं दिनांक SIGNATURE & DATE
TSX	Sandeep Gupta	09/6/20	अनुवादक TRANSLATED BY		
BAX	B.B.Tripathy	05/06/20	निर्माणकर्ता WORKED BY	PRASHANT MISHRA	4/6/2020
PSC MEMBER	R.K.Sharma	5/6/2020	जांचकर्ता CHECKED BY	AMIT MITTAL	4/6/2020
सहमत विभाग AGREED DEPTT	नाम NAME	हस्ताक्षर एवं दिनांक DATE & SIGNATURE	पर्यवेक्षणकर्ता SUPERVISED BY	RK SHARMA	5/6/2020
SUPERSEDES			स्वीकृति APPROVED : RAKESH KUMAR (AGM, EME)	05/06/2020	Gr. NO. 6.18
REV.NO.	03		निर्माण PREPARED : EME	जारी ISSUED : TSX	दिनांक DATE : 17.10.1996
Dt.	06-06-2020				
CHANGE ADVICE NO.	TGE-19-64	06-06-2020			

SIGN & DATE: 12/06/20

INVENTORY NO.: P. 2628

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SUPERSEDES INVENTORY NO

SIGN & DATE 12/06/20

INVENTORY NO. P.2628

REV. NO. 03		निर्माणकर्ता WORKED BY	PRASHANT MISHRA	Prashant	4/6/2020
		जांचकर्ता CHECKED BY	AMIT MITTAL	Amit	4/6/2020

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REV. NO. 03		निर्माणकर्ता WORKED BY	PRASHANT MISHRA	[signature]	4/6/2020
		जांचकर्ता CHECKED BY	AMIT MITTAL	[signature]	4/6/2020

सामग्री सूची संख्या INVENTORY NO P2628
SIGN & DATE 12/06/20

General Information

1. Scope

This instruction for preservation & painting is valid for Turbo-generators, Exciter and Auxiliary system components for inland and overseas preservation (including coastal regions). The surface treatment is valid as standard procedure. In case where deviations are requested by the customer or another party, these are to be specified in writing. This specification is also valid for machined, structural and cast components manufactured by sub-contractors.
Any reference made to other standards/drawings in this specification refers to the latest revision of the respective documents.

1.1 Coating materials

The preservation media and coats applied to Turbo-generator components used in conventional power and nuclear stations are given in the specifications.

1.1.1 Coating materials for parts manufactured by other firms

With parts manufactured by other firms, the coating material prescribed in the material description (see Table No. 4) shall be applied. If it is not possible to obtain these materials, material with same base or composition from another manufacturer may be applied after approval from ISE department.

1.2 Final Coat

The final coating of the Turbo-generator, Exciter and Auxiliary Systems is applied by BHEL or customer at site after the machine has been completely assembled.

1.2.1 Covered Parts

An exception to this are surfaces which are no longer accessible on site. These receive the complete coating at BHEL works, factory or at the sub-contractors. For this, contact surface will be treated according to section 2.3.1. Parts covered by foundations are to be coated on site before assembly.

1.2.2 Control and Monitoring Parts

Control and monitoring parts outside the hot area receive a covering coat of PUR-varnish paint from synthetic resin (PUR = Polyurethane). Where a color difference between the piping and connection areas is necessary, a corresponding identification will be made with PUR varnish.

2. Technical Details

The coating, in the sense of this specification, has the function of protecting the surfaces against deterioration during manufacturing (Machined/Un-machined surfaces), transport, storage and operation.
Preservative which are to be applied manually or mechanically are considered as coats of paint, varnishes and similar products.
The type of preservative and thickness of the coats is selected according to the intended or expected stress, environmental conditions and duration of employment of the components and has been specified in the list relating to components given in Table No. 3. To allow a better control during the application, the individual layers are to be clearly differentiated from each other by colors.

2.1 Conditions for Surface protection

The surface protection material must be applied carefully, without pores and must have uniform thickness. The covering must not be interrupted at any point, e.g., at transition points, pipe connections, connecting pieces. Air inclusions are not permissible. Each individual coat must properly dry before next coat is applied.

At the time of first treatment, the surfaces to be protected must be dry and show metallic skin, i.e., free of scales, rust, grease, rolling skin, layout paint, dirt, slag, block pipe beads or other foreign bodies which could adversely affect the adhesion of the coating material (see clause 4.1).

Blasting as per pre-treatment is in general to be preferred to any other type of pre-treatment. Apart from this, it is allowable to wet clean the coats. When neutral cleaners are employed one must rinse thoroughly with water or a de-ionized medium.

2.2 Thickness of Layers

The coating thickness is to be selected according to the intended or expected stress and length of the employment.
No thickness can be given for preserving media containing mineral oil. Due to their consistency, they run together and although they form a continuous layer, the thickness of this cannot be provided.

2.3 Surface Condition

2.3.1 Machined Surfaces

Machined areas to which parts are attached, e.g., seats and movable parts, threads, identification plates, connecting media etc., remain free of paint.

During the manufacturing process in shop, at the end of each operation or during transportation, they are to be purposefully protected with rust-proof media. Unless otherwise stated, contact areas are to be protected for transportation with a corrosion inhibitor like TRP etc.

Means of connection such as screws, bolts, nuts, tie bars, etc. can also be coated in accordance with this specification, provided their function is not affected.

2.3.2 Welding Seams for Pressure or Leakage Test

All welds to be subjected to a pressure or leakage test remain free of paint until final acceptance. When tests have been completed, the seams are to be treated according to clause 4.1.4.

2.3.3 Welding areas

Surface areas in which welding is to be carried out later remain free of paint to approx. 80 mm from the weld edge. Surface areas are to be protected by a welding primer if manufacturing is interrupted and they are stored outside. When dispatching such parts, the areas left without paint must be treated according to clause 4.1.4.

2.4 Preserving Media

Preserving medium according to the prescribed application given in below are permitted. They must not be applied directly on top of each other. Before a different preserving medium is applied, the previous one must be carefully washed off. Changing the medium is only permissible after testing and approval from ISE.

2.4.1 Slushing Oil

Slushing oil has been tested for its compatibility with bearing oils and fire resistant fluids. It dissolves in bearing oil without any adverse effects. In fire resistant fluids, it shows no influence up to a max mixture of 0.1 Vol %. Hence, it is not absolutely essential to remove it before or during the assembly of parts.

2.4.2 Dewatering Fluid

It is only applied for short term protection during the factory production with small parts and welding seams. It must definitely be washed off from all parts before assembly in the factory or preparation for dispatch. The cleaned parts are then to be treated immediately according to the relative instructions.

2.4.3 Corrosion Inhibiting Media

Corrosion inhibiting media like TRP are only employed for transportation or long term storage. It must be completely removed before assembly. When several layers are applied, at least 8 hours are to be allowed for the drying of each layer.

2.4.4 Removal of Preserving Media

All preserving media can be washed off by cold cleaners or solvents. Care must be taken here that no remains whatsoever are left in hollow spaces or recesses in the components. Cleaning is also possible by means of high pressure, hot steam equipment with the addition of detergents.

2.5 Coating Materials

The requirements regarding protection against corrosion for manufactured components can be met by coating materials given in the specification. The components are divided into two areas with various requirements and different coating materials.

Group- 1: Covers all parts with temperatures up to 120° C. They are coated with epoxide resin (EP) primers. PUR varnishes are used as coating for governing components in this area (see clause 1.2.2).

Group- 2: Covers all parts with temperatures up to 120° C – 600° C. These are coated with silicon resin coating system.

The coating materials are always to be stirred thoroughly, preferably with slow running pneumatic mixers before beginning the work. If the work continues for longer time, stirring should be done approx. every hour.
Supply specifications for coating materials with regard to viscosity, resistance to chemical substances, uniformity of color, etc. are contained in respective specification.

2.5.1 Epoxide Resin

Two component epoxide resin primers are used with zinc phosphate as corrosion inhibiting pigments. They are to be mixed and processed according to details given in the specification with the prescribed weights of resin and hardener. Two component mixing equipment may also be employed. After mixing, the epoxy primers must be applied within the pot life given by manufacturer.

2.5.2 PUR-Primers

As a covering for parts mentioned in clause 1.2.2, two component paints on a polyurethane base according to the RAL card are employed. These are also to be mixed according to the details given by the manufacturer with the prescribed amounts of resin and hardener and are to be applied taking the pot life into consideration.

2.5.3 Silicon Resin

For the so called "hot components" (operating temperature range 120°C – 600°C), a silicon resin-aluminium coating system is employed. This system consists of 2 (for domestic) or 3 (for overseas parts and those exposed to the elements) harmonizing coats on top of each other.

The resin and powder of the one component coating material are delivered separately for reasons of durability and after mixing (Shaking together) the material is to be stored in a cool place with air excluded. It can be used for application for approx. 1 month.

2.5.4 Welding Primer

A two-component epoxy resin welding primer containing no chromate is applied to steel components when manufacturing is interrupted in order to protect them. It is to be mixed with the prescribed amounts of resin and hardener according to details given by the manufacturer and applied within the pot life. Any remaining amounts that have been mixed must be thrown away after this time. The epoxy welding primer can be painted over with epoxy primers.

2.5.5 Insulating Coats

The varnishes and resins listed have been specially selected according to the respective electrical requirements for insulating coats of some components. They must definitely be applied in the specified manner and can only be replaced by another type after specific permission has been obtained from ISE / EME.

2.6 Surface Treatment of Particular Components

2.6.1 Studs

Studs are to be preserved with industrial grease / oil and plastic protecting caps (also hose-like synthetic net) before dispatch.

2.6.2 Tapped Holes

Tapped holes are always to be protected with corrosion inhibiting / grease until dispatch. Additionally, blind holes must be closed with plastic caps.

2.7 Bought-in parts

For all items purchased from other firms (catalogue parts, filters, clamps, consoles, etc.); surface protection corresponding to this specification shall be stated with the order or technical supply specification respectively.

If a manufacturer cannot fulfill the requirements, he can himself determine which of his products needs protection against corrosion during transportation and storage. Exact details of the protective media and surface treatment are to be sent to EME / ISE Department for approval.

The protective measures against corrosion must not affect the functioning and application of the products. The type of packing must also prevent damage due to corrosion, storage and transportation.

2.7.1 Bought-in Parts Without Coating

When small parts and accessories delivered from other firms have either a different type of coating or none at all, these are to be treated in the pre-assembly stage according to the respective design group sheets Table No. 3 of this specification. With this, preliminary treatment of the metal is to be performed according to clause 4.1.

2.8 Pre-assembled Components

Assembled components should always to be provided with an effective protection against corrosion on the inside. Where it is not possible to apply a preserving medium, protection against corrosion is to be provided by impregnated paper or desiccants. Basically, this is also valid with transportation overseas or long-term storage for shiny parts such as cylinder, moving areas and bearing points etc.

3 Work Place

The application of coating materials should take place in special, well-aired rooms. If this is not possible, an area of 5 m x 5 m, depending on the degree of danger, should be declared a safety area for application of larger amount of the coating material (more than 5kg / 8h). Within this safety area smoking, naked flames and the use of machines causing sparks is forbidden. Sufficient ventilation must be ensured.

3.1 Responsibility

The surface protection is to be applied directly in the shop areas responsible for the particular stage of manufacture. In the classification of components in Table No. 3, sections are not given but only production areas.

3.2 Protective Clothing and Equipment

Protective clothing must be according to safety regulations (fire resistant) and must be changed immediately if it becomes wet with hardener. In addition to this, it must be kept separate from private clothing.

Respirators, that are independent of the ambient atmosphere, must be worn in closed rooms having insufficient ventilation.
Furthermore, protective clothing such as gloves, glasses, etc. should be used depending on the possibility of danger. If necessary, suitable skin protection media are should be used (see clause 10).

4 Manufacturing Methods

In drawings and dockets, the following reference is to be made for preservation:

SURFACE TREATMENT ACCORDING TO 0912.015.

The details of designated coating material are covered in Table No. 3 of this standard.

4.1 Removal of Surface Contamination

Impurities such as dirt, oil, etc., which adversely affect the adhesion or effectiveness of the coating are to be removed.

Scale, rust and dust, as well as previous coating are to be removed to achieve the specified degree of cleanliness. For this, pre-treating with blasting is generally preferred to any other form of pre-treatment. With any cleaning media, it must be ensured that no remnants remain in hollow spaces or recesses in the components.

4.1.1 Removal of grease with solvents

Oil and grease contamination is removed from rough surfaces by wiping with solvents like Trichloroethylene. Surfaces which have already been painted may only be cleaned with white spirit. With larger components "wet cleaning" with high pressure hot steam equipment and detergents (neutral cleaners) is permissible. By using the medium and subsequently rinsing with clear water and / or a deionized medium, it must be ensured that the cleaned surface areas have a pH-value of 6 - 8.

4.1.2 Removal of rust by Chemicals

Removal of rust by means of chemicals is only permitted for smaller steel components, pipes and fittings using bathing process. With the painting process, removing rust by means of the so-called "rust converters" is not permissible. The cleaned surfaces must have a pH value of 6 - 8.

4.1.3 Removal of Rust by Mechanical Means

The removal of rust from non-machined surfaces is to be performed by blasting (grain size smaller than 1.2 mm) to achieve surface roughness Rz 40-60µm. Technological standard is valid for shot blasting and cleaning work and for surface assessment after cleaning.

The surface condition must comply with the standard. Components must not be damaged or deformed. Subsequent cleaning by sweeping, brushing, suction or, preferably, blowing with dry oil-free pressurized air is to be performed. Blasting media must be prevented from penetrating the inner spaces by sealing any openings. Where penetration cannot be prevented, the area concerned must be thoroughly cleaned afterwards.

4.1.3.1 Blasting

Blasting is performed according to technological standard. During correction work, any parts not to be processed and surfaces which have already been coated must be covered up.

4.1.3.2 Removal of Rust With Machines

Where scale has firmly adhered to the surface, it must be removed by mechanical means such as rotating wire brushes, impact piston device or rotary de-scalers, needle scalers, sanding discs or similar equipment.

4.1.3.3 Removal of Rust by Hand

Rust is only removed manually while carrying out corrective work, treatment of weld seams and in accessible points. This is done with wire brushes, stripping knives, scrapers, rust removing hammers etc.

4.1.4 Pre-treatment of Welds and Welding Areas

For surfaces not coated for testing, subsequent welding work or other reasons, any testing media, globules, burrs, dust, grease, etc. must be removed according to clause 4.1 of this specification before correction work is performed.

4.1.5 Removal of Faulty Coatings

Defective coatings are to be removed by blasting, pickling, paint remover, solvents or grinding so that the specified degree of cleanliness is achieved.

4.2 Treatment of Cleaned Parts

Due to susceptibility of rust and dirt, cleaned parts are to be protected with a primer or preserving medium immediately after the cleaning procedure. If the course of production does not allow this, the surface requirements of unprotected areas must be ensured by treatment, blasting or manual cleaning, later.

4.3 Adhesive Strength

The adhesive strength of the coating material is highly dependent upon the wetting of base. Special care must therefore be taken when applying the primers.

4.4 Application of Coating

Primers; coating paints and preservatives are to be applied by brush strokes/air spray/air less spray as feasible. With low ambient temperatures (under 10^0 C) & high humidity (over 85 %), primers should only be applied by brush, NOT by spraying.

If there are to be several primer coats, every coat must be sufficiently dry, free of any moisture or impurities before the next coat is applied. If a longer period of time has elapsed between the applications of the coats (more than 3 months), the last coat must be slightly roughened with a suitable medium. Wiping with a cold de-greasing agent is sufficient when stored indoors.

4.4.1 Coating in Open Air

Coating in the open air should be avoided. It must not be performed at all if:

a) The temperature drops below 10° C.
b) The temperature of the part being coated rises so much that the required thickness and quality can no longer be achieved.
c) The relative humidity is higher than 85%.

4.4.2 Storage of Freshly Painted Parts

Freshly painted parts must not be stored in the open air until they are thoroughly dry. Care must be taken that they cannot settle into the ground and corrosion through contact with other parts is avoided. In addition, rain water must drain properly. During transport or storage at site, painted parts are to be covered with tarpaulin sheets as far as possible.

4.4.3 Damage to Surface Protection

Damage to surface protection or improperly applied coats is to be corrected immediately using the same preserving material. Care must be taken that the coat in the corrected areas definitely has the specified thickness. In the case of slight damage, the base material is to be carefully cleaned and rust removed. The margins around the damage must be roughened so that they will bond better with the coats already applied. The repair coats are applied by brush/ airless spraying. Larger areas of damage can be prepared for repair work by partial blasting.

4.4.4 Processing Instructions

The paint and preserving media are to be processed according to respective specifications. Only diluting media supplied by the manufacturer or those recommended may be used for bringing the coating material to the right consistency before application.

Apart from this, the processing time (pot-life) given for the two-component materials must be followed. Only the amounts that can be processed within this time are to be mixed. Any amounts remaining after this specified period are not to be used even if they appear to have sufficient viscosity.

4.4.5 Change for supplier

If suppliers are changed, ISE must first examine the quality of the varnish.

4.5 Filing and Smoothening of Surfaces

Generally surfaces are not filed. In exceptional cases, however, plainly visible areas or localized areas which have become uneven due to flame cutting, welding or similar work may be filed and smoothened.

Surfaces where the primer is un-damaged, a two component EP filler can be applied according to the manufacturer's instructions directly on to the previously roughened coat. Surfaces where the primer is damaged, the area is to be treated right down to the base according to clause 4.1. The epoxy primers can be applied direct to the filler surface when this is dry and has been smoothened.

5 Test and Testing Media

The test covers surface sealing, thickness, uniform and proper application of coats as well as a random check of uniform adhesion of the layer over the whole surface.

5.1 Testing the Coating Materials

The coating materials are continuously being subjected to tests at the manufacturer works. On delivery, only random checks are performed regarding the formation of skin and sediments. Normally, no skin should have formed. Any, sediment must be soft and easy to disturb.

5.1.1 Viscosity Test (IS 3944)

Before start of work, the viscosity is to be tested by means of a pouring test. If the efflux time values are exceeded, the paint is to be diluted to the average value with the prescribed diluents, taking the maximum permissible additive into account. If the efflux time is too short, a new lot is to be taken. The coating materials must only be diluted to the application viscosity with diluents as recommended by the manufacturer.

5.2 Testing Parts That Have Been Blasted

Parts that have been blasted, should be Rz = 40µm to 60µm. Contamination from grease can be determined by pouring water on the surface.

5.3 Check of Coating Thickness

The coating thickness is to be tested with a measuring instrument (e.g. Paint thickness gauge) by random checks in the shop area concerned.
A final check by QC must be arranged by the shop area. The measured values, with details of measuring temperature, time of measurement and measuring devices used are to be recorded in the QC report. Parts which do not have the minimum specified coating thickness must be improved (see clause 4.4.3).

5.4 Test of Adhesion

The adhesion is only tested by special instruction. For this, either a cross-cut test is performed or an assessment is made with the adhesion method.

5.5 Receiving Inspection

When checking on receipt, care must be taken that all components manufactured by outside firms comply with the requirements for surface protection. In addition to this, the delivery must be accompanied by a certificate showing the coatings and preserving media use and if necessary, a decontamination certificate must be supplied. Parts which have either not been treated at all or not according to our specification should be reported to ISE / EME for treatment before being stored.

5.6 Site Test

Parts arriving at the site are to be checked by BHEL Quality Department and / or BHEL Site management and / or according to the agreement, a representative of the customer. Any deficiencies found are to be reported immediately and eliminated by site personnel.

6 Transportation Instructions and Dispatch Conditions

The utmost care is to be taken when transporting, storing and assembling components with surface protection. Protective intermediate layers are to be provided. Existing suspension and transport devices must be used.

6.1 Mode of Transportation

The mode of transportation is specified in the order sheet. For clarification of questions regarding transportation, the dispatch department must be consulted.

6.2 Transportation of Painted Components

Painted components may only be transported when the paint is completely dry (see clause 4.4.2). An exception to this is when rotation of the individual parts is un-avoidable or when they must be stacked in a place suitable for drying (note clause 6.3).

6.3 Damage in Transport

Damage coats must be repaired locally, immediately after transportation. After the damaged surface has been roughened, identical coatings must be applied to maintain coating thickness or another suitable material that has been agreed upon must be applied at site (see clause 4.4.2 and 4.4.3).

6.4 Long term Storage and assembly

With long-term storage and assembly (more than 18 months) the measures given in clause 7 to 9.6 which deviate from the standard procedure or are additionally necessary are to be performed.

7 Long Term Storage

Measures for long-term storage must be undertaken when storage and assembly time exceeds 18 months. In addition to the normal measures for the storage of generator and exciter components, further measures are generally necessary. These are to be decided on case to case basis.

8 General Outer Surface

8.1 Primer painted Parts

All surface that have been pre-treated with Epoxy primer and come in contact with open air receive an additional coating of 40µm (min.) after cleaning. The paint to be used will always be specified by EME / ISE.

8.2 Machined Parts

All flange, connection, base, support and other machined surfaces receive several coats of Anti-corrosion agent (TRP 1706) (AA55155) up to a min. thickness of 80µm. Additional coats should be applied in areas which are especially endangered and are important for functioning. Approx. 8 hours must be allowed before applying the next coat.

8.3 Threads, Tap Holes and Bores

All threads, tap holes, bolts, movable "Shiny parts" and bores which are accessible from outside or are exposed are to be protected with Lithium based Grease Grade 3 (AA57401).

9 Special Component Protection

9.1 Stator Core Bore

After the test run, the bore of Wound Stator is coated with Coating Varnish 2404 or IE 82 / 83 (AA27513 or HW27589).

9.2 Generator Rotor

Shaft ends and coupling holes are treated as stated under clause 8.2 and 8.3. The cap areas are to be dried with Air-Driers before packing. After testing the rotor is to be painted with Becktol Grey (AA27513) on retaining ring & barrel.

9.3 Sealing Oil, Water Accessories and associated Piping

Special specifications are prepared for each order for internal preservation. Austenitic parts and rubber-coated containers do not have any special internal protection.

9.4 Wound Stator

The Wound Stator assembly is to be preserved and packed as per 'Sealing for Transport' drawing.

9.5 Exciter Rotor

After the test run, the exciter rotor must be blown out and dried with dry air. Shaft ends and coupling holes are treated as stated under clause 8.2 and 8.3.

10 Safety Regulations

When working with coating materials & solvents as per this specification, inner-factory safety rules (e.g. "List of Dangerous Working Materials"), the relevant safety & industrial accident prevention regulations and rules issued by BHEL Safety Department are valid.

Additionally, it must be taken into consideration that where parts coated with paint based on polyurethane and epoxide resin are concerned, any subsequent heating over 100° C must be avoided because of the formation of poisonous fumes. If it is necessary to perform welding or grinding work on the painted parts, the paint in the area of the work is to be removed.

During cleaning work and mixing of coating materials, protective gloves are to be worn. Protective glasses or a face shield are to be used for protection from spray. If any of the medium gets into the eye, it must be rinsed immediately and an emergency call for "First Aid" must be made.

Hands are to be thoroughly cleaned, especially before meals, visits to the toilets and at the end of the work time. Remnants of resin on hands and finger nails are only to be removed with water and soap or special cleaning media. No solvents are to be used. Protective cream for the skin is to be used regularly. Food and drinks must not be kept or consumed in the working area. Smoking during work or within the working area is forbidden. Instructions under clause 3.2 are to be observed.

11 Assembly-wise Preservation and Painting of components

The assembly-wise (PGMA wise) painting and preservation of components is given in Table No. 3. For parts without exact details, surface treatment is to be carried out according to the respective drawing and associated main assembly.

The following specified surface treatment is valid for inland and overseas preservation (including coastal regions). Additional measures are only necessary for long term storage (over 18 months). A general description is summarized in clause 7 to 9 of this specification; a detail description is given in the drawings and dockets of respective components.

The pre-determined coatings are numbered consecutively from 1 - 4 in the matrix. Material occurring for the first time in the numeration are to be applied immediately after the specified surface condition has been produced.

The material to be used are given in Table No. 4 with respective material specifications and are listed here in the assembly-wise sheets under the material description column. Further, the table is divided into exterior and interior surfaces. Where surfaces are not clearly defined appropriate information on drawings and notes on relevant assembly-wise sheets is noted.

The following specified surfaces protection must only be applied after pre-treatment and taking the general measures according to clause 1 to 6 into consideration.

12 Thickness of Coating

The thickness of the coating is, generally, 40µm/coat with the epoxy primers & the anti-corrosion agents and 15-20µm/coat with the welding primers and the silicone coating materials (see also clause 2.2).

13 Cross Referred Standards

AA56114	HW27589	AA57401	AA56703
AA56112	AA27513	AA57104	AA51406
AA56126	TG60332	AA57804	AA51407
AA55155	TG60334	AA56701	AA51408
TG60140	TG60333	AA57602	AA55619
TG82712	IS 3944		

Table No. 1

Preparation of surfaces of various parts before painting (BHEL Specification AA0674101)

Serial No.	Description of the surface to be coated		Processes
1.	Surfaces of castings and welded parts which are not machined.	1.	Subject the part to shot blasting.
		2.	Blow the compressed air and clean the part.
		3.	De-grease and clean with cotton waste dipped in white spirit or petrol.
		4.	Dry with the help of cotton waste or cloth.
2.	Machined surfaces of metallic parts.	1.	Clean the rusted places with fine emery paper.
		2.	De-grease and wash with cotton waste dipped in white petrol or spirit.
		3.	Dry with the help of cloth or cotton waste.
3.	The places of part which are not accessible (inner surface of inlet or drain pipe and inner hole of rotor shaft etc.)	1.	De-grease the surface with cloth dipped in white spirit or petrol.
		2.	Wipe it with clean cloth or cotton waste.
4.	Surface of winding and other parts before final finishing (after testing).	1.	Blow it with clean compressed air.
		2.	Wipe with cloth dipped in white petrol.
		3.	Dry at room temperature for not less than one hour.
5.	Surface covered with primer or enamel before coating with next layer.	1.	Rub it with sand paper No 120.
		2.	Blow it with clean compressed air.
		3.	Clean with cloth dipped in white petrol.
		4.	Dry with the help of clean cloth.
6.	Surfaces of rotor after testing and before dispatch to the customer.	1.	Clean the surfaces with moisture free nitrogen.
		2.	Clean the parts with the help of cloth of winding which are accessible.
7.	The metallic surfaces of the parts not requiring machining and shot blasting.	1.	Clean the surface from rust dirt and scale with the help of abrasive disc, grinder or chisel.
		2.	Blow the clean, dry compressed air.
		3.	Wipe it with clean cloth dipped in white spirit or petrol.
		4.	Wipe it dry with the help of cloth.
8.	The surfaces of insulated bus bar, overhang parts of rotor.	1.	Blow the surfaces with clean dry compressed air so that dust and dirt is removed.
		2.	Wipe the surfaces with the help of clean napkins.

Table No. 2

Working viscosity of paints

Serial No.	Description of material	Material Specification	Viscosity in seconds (Ford Cup-4)			Drying Time (Hours) (Amb. Temp
			Spray	Brush	Dipping	
1.	Epoxy Based Zinc Rich Primer Paint	AA56114	-	-	-	4
2.	High Build Intermediate Epoxy Paint	AA56112	-	-	-	12
3.	Full Gloss Polyurethane Finishing Paint	AA56126	30	60-80	-	12
4.	Thinners for Priming Paints	AA56708	-	-	-	-
4.	Anti-Corrosive Agent (TRP 1706)	AA55155	As supplied			1-2
5.	Insulating Enamel Red / Coating Varnish 2404	HW27589 TG60140	18-20	30-35	16-20	8
6.	Alkyd Protective Coating Enamel IE 82 or 83	AA27513	18-20	30-35	16-20	8
7.	EP Weld Primer	TG60332	80	40	-	1
8.	Grease Mobilux-2 or IOC Industrial Grease	AA57401	-	-	-	-
9.	White Spirit	AA56701	-	-	-	-
10.	Oil Resistant Synthetic Enamel	AA56132	-	-	-	5

Table No. 3
Assembly-wise Preservation and Painting Components

PGMA : 13501, 13502, 13513
PART : Stator Frame, Cooler Housing

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc rich Primer Paint #*	*Epoxy based Zinc Rich Primer Paint #*
	Material	*AA56114*	*AA56114*
	DFT	*100µm min.*	*80µm min.*
	Performed by	*Shop : Fabrication Area*	*Shop : Fabrication Area*
2.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint $*	*Epoxy based Zinc Rich Primer Paint $*
	Material	*AA56114*	*AA56114*
	DFT	*100µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
3.	Surface Condition	*Machined*	*Painted*
	Coating	*Anti-Corrosive Agent TRP 1706*	*Coating Varnish 2404 or IE 82 / 83 (Red)*
	Material	*AA55155*	*HW27589 / AA27513*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
4.	Surface Condition	*Painted*	
	Coating	*Refer Table No. 5*	
	Material		
	DFT		
	Performed by	*Shop : Assembly Area*	

Remarks: # Leave weld seams free of paint.

$ After machining and Hydraulic & Pneumatic Test, only the weld-seams and other areas (only where coating is damaged) is to be coated.

Notes:

1. Boss (in Stator Frame) to be coated with *Anti-Corrosive Agent TRP 1706 (AA55155) (80µm min.) in Fabrication Area.*
2. During fabrication, Machined-areas (like Terminal Plate etc.) to be coated with *Anti-Corrosive Agent TRP 1706 (AA55155) (80µm min.) in Fabrication Area.*
3. Threaded portion to be coated with Lithium based Grease Grade 3 (AA57401).
4. THDF 115/67 & 125/67 TG: Overhang chamber at TE to be coated with IE 82 / 83 (Red) (AA27513) by assembly area (Block-1) before dispatch to fabrication area (Block-2) for welding of ventilation plates. The top surface of ribs (of stator frame) at the welding-locations of ventilation plates remain free of this coating.

उत्पाद मानक (हीप : हरिद्वार)

PRODUCT STANDARD (HEEP: HARIDWAR)

PGMA : 13504
PART : Core Press Ring (except TVPI sets*)

		(Non-finger side surface)	(Finger-side surface)
1.	Surface Condition		*Machined*
	Coating		*Epoxide priming paint @*
	Material		*AA56105*
	DFT		*80µm min.*
	Performed by		*Shop : Fabrication Area*
2.	Surface Condition	*Blasted / Cleaned*	*Painted*
	Coating	*Coating Varnish 2404 or IE 82 / 83 (Red) %*	*Coating Varnish 2404 or IE 82 / 83 (Red) $*
	Material	*HW27589 / AA27513*	*HW27589 / AA27513*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:
@ After welding of press fingers.
% After welding of support bracket and other winding assemblies.
$ Before installation on Stator Core

Notes:
* For TVPI sets – The Core Press Ring to be coated as per respective drawing & CBOM.

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उत्पाद मानक (हीप : हरिद्वार)

PRODUCT STANDARD (HEEP: HARIDWAR)

PGMA : 13504, 13521
PART : Stator Core, Magnetic Shunt Assembly (except TVPI sets)

		Outer Surface	Inner Surface
1.	Surface Condition	*Cleaned*	
	Coating	*Coating Varnish 2404 or IE 82 / 83 (Red)*	
	Material	*HW27589 / AA27513*	
	DFT	*80µm min.*	
	Performed by	*Shop : Assembly Area*	
2.	Surface Condition		*Cleaned*
	Coating		*Coating Varnish 2404 or IE 82 / 83 (Red) #*
	Material		*HW27589 / AA27513*
	DFT		*80µm min.*
	Performed by		*Shop : Assembly Area*
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:
After completion of Winding assemblies.

Notes:
For TVPI sets: The core remains free of any coating before insertion in resin tank. After impregnation in resin tank, the wound stator to be coated as per drawing.

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PGMA : 13504
PART : Spring Baskets (Core Ready for Winding) (except TVPI sets*)

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint $ @*	*Epoxy based Zinc Rich Primer Paint $ @*
	Material	*AA56114*	*AA56114*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Fabrication Area*	*Shop : Fabrication Area*
2.	Surface Condition	*Machined*	*Machined*
	Coating	*Anti-Corrosive Agent TRP 1706 #*	*Anti-Corrosive Agent TRP 1706 #*
	Material	*AA55155*	*AA55155*
	DFT	*40µm min.*	*40µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
3.	Surface Condition	*Blasted*	
	Coating	*Epoxy based Zinc Rich Primer Paint @*	
	Material	*AA56114*	
	DFT	*80µm min.*	
	Performed by	*Shop : Assembly Area (after welding with Core assembly)*	
4.	Surface Condition	*Painted*	
	Coating	*Coating Varnish 2404 or IE 82 / 83 (Red) @*	
	Material	*HW27589 / AA27513*	
	DFT	*80µm min.*	
	Performed by	*Shop : Assembly Area (after welding with Core assembly)*	

Remarks:
To be removed before installation.
$ The joints in half-rings of Spring Basket not to be coated.
$ 20mm area radially from the inner-dia (ID) not to be coated on all four faces of Spring Baskets.
@ Area of plate on Spring Baskets for welding with Bush (in Stator) to remain free of any coating. Coat the same after welding (in Stator) in assembly area.

Notes:
*For TVPI sets: The Spring Baskets to be coated as per respective drawing & CBOM.

PGMA : 13501, 13504

PART : Preparation of Stator for Core Insertion, Spring Mounted Core Housing, Suspension Arrangement, Stator Core Housing, Welding of Ventilation Plates

		Inner Surface
1.	Surface Condition	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint*
	Material	*AA56114*
	DFT	*80µm min.*
	Performed by	*Shop : Fabrication Area*
2.	Surface Condition	*Machined*
	Coating	*Anti-Corrosive Agent TRP 1706 #*
	Material	*AA55155*
	DFT	*80µm min.*
	Performed by	*Shop : Assembly Area*
3.	Surface Condition	*Painted*
	Coating	*Coating Varnish 2404 or IE 82 / 83 (Red) $*
	Material	*HW27589 / AA27513*
	DFT	*80µm min.*
	Performed by	*Shop : Assembly Area*
4.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	

Remarks:

\# Only for Spring Mounted Core-Housing (500 MW).

$ Area of Spring for welding with Bush will remain free of any coating. After welding, Spring and Bush to be coated.

Notes:

1. THDF 115/67 & 125/67 TG: Overhang chamber at TE to be coated with *Coating Varnish 2404 or IE 82 / 83 (Red) (HW27589 / AA27513)* by assembly area (Block-1) before dispatch to fabrication area (Block-2) for welding of ventilation plates. The top surface of ribs (of stator frame) at the welding-locations of ventilation plates remain free of this coating.
2. Plates of Welding of Ventilation-plates assembly to be coated with:
   a) Epoxy based Zinc Rich Primer Paint AA56114 80µm min. in Fabrication Area.
   b) Coating Varnish 2404 or IE 82 / 83 (Red) (HW27589 / AA27513): 80µm min. on the outer diameter (OD) side before welding.

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उत्पाद मानक (हीप : हरिद्वार)

PRODUCT STANDARD (HEEP: HARIDWAR)

PGMA : 13936, 13937
PART : Casing End Parts, End Shields

		Air Side Surface	Hydrogen Side Surface
1.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint #*	*Epoxy based Zinc Rich Primer Paint #*
	Material	*AA56114*	*AA56114*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Fabrication Area*	*Shop : Fabrication Area*
2.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint $*	*Epoxy based Zinc Rich Primer Paint $*
	Material	*AA56114*	*AA56114*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
3.	Surface Condition	*Machined*	*Machined*
	Coating	*Anti-Corrosive Agent TRP 1706*	*Anti-Corrosive Agent TRP 1706*
	Material	*AA55155*	*AA55155*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
4.	Surface Condition		*Painted*
	Coating		*Coating Varnish 2404 or IE 82 / 83 (Red) @*
	Material		*HW27589 / AA27513*
	DFT		*80µm min.*
	Performed by		*Shop : Assembly Area*

Remarks:
Leave weld seams free of paint.
$ After machining and Hydraulic & Pneumatic Test, only the weld-seams and other areas (only where coating is damaged) is to be coated.
@ For End Shield EE of THDF module, this coating is to be done before installation of Shielding of End Shield EE.

Notes:
1. Bearing chamber, Bearing drain, Hydrogen separator chamber to be left free of any paint / primer (refer docket for details). These are to be preserved *using Lube oil VG 46 (AA57104)*. Rest of the chambers to be preserved as per Air Side surface.
2. Threaded portion to be coated with *Lithium based Grease Grade 3 (AA57401)*.

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SIGN & DATE 12/6/20
INVENTORY NO. P.2628

PGMA : 13909
PART : Terminal Box

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint #*	*Epoxy based Zinc Rich Primer Paint #*
	Material	*AA56114*	*AA56114*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Fabrication Area*	*Shop : Fabrication Area*
2.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint $*	*Epoxy based Zinc Rich Primer Paint $*
	Material	*AA56114*	*AA56114*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
3.	Surface Condition	*Machined*	*Painted*
	Coating	*Anti-Corrosive Agent TRP 1706*	*Coating Varnish 2404 or IE 82 / 83 (Red)*
	Material	*AA55155*	*HW27589 / AA27513*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:
Leave weld seams free of paint.
$ After machining and Hydraulic & Pneumatic Test, only the weld-seams and other areas (only where coating is damaged) is to be coated.

Notes:
Threaded portion to be coated with *Lithium based Grease Grade 3 (AA57401).*

PGMA : 13524
PART : Stator Winding Attachment

1.	Surface Condition	*Blasted / Machined / Cleaned*
	Coating	*EP Weld Primer #*
	Material	*TG60332*
	DFT	*40µm min.*
	Performed by	*Shop : Assembly Area*
2.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	
3.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	
4.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	

Remarks:
Only weld-seams between Support Bracket and Core Press Ring to be coated.

PGMA : 13522
PART : Arrangement of Support Ring Mountings

1.	Surface Condition	*Blasted / Machined / Cleaned*
	Coating	*EP Welding Primer #*
	Material	*TG60332*
	DFT	*40µm min.*
	Performed by	*Shop : Assembly Area*
2.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	
3.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	
4.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	

Remarks:
Only weld seams between Support Bracket and Core Press Ring to be coated.

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		जांचकर्ता CHECKED BY	AMIT MITTAL		4/6/2020

INVENTORY NO. P.2628

PGMA : 13508
PART : Stator Winding Assembly

		All Surfaces
1.	Surface Condition	*Cleaned*
	Coating	*Coating Varnish 2404*
	Material	*HW27589*
	DFT	*40µm min.*
	Performed by	*Shop : Assembly Area*
2.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	
3.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	
4.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	

PGMA : 13505, 13508
PART : Mounting of Header, Support Ring

		All Surfaces
1.	Surface Condition	*Cleaned*
	Coating	*No Coating*
	Material	--
	DFT	--
	Performed by	--
2.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	
3.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	
4.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	

Notes:
Support Ring – No preservative coating required as it is already present from vendor works.
Header – The material of Header is Stainless Steel, no coating required.

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		जांचकर्ता CHECKED BY	AMIT MITTAL	[signature]	4/6/2020

PGMA : 13912
PART : Arrangement of Terminal Bushing

		All Surfaces
1.	Surface Condition	*Machined*
	Coating	*Anti-Corrosive Agent TRP 1706 #*
	Material	*AA55155*
	DFT	*80µm min.*
	Performed by	*Shop : Assembly Area*
2.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	
3.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	
4.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	

Remarks:
Machined items of mild-steel to be coated.

Notes:
The Terminal Bushings remain of free of any coating.

PGMA : 13601
PART : Rotor Shaft (Areas to be painted as identified in drawing)

1.	Surface Condition	*Machined*
	Coating	*EP Weld Primer + Hardener*
	Material	*TG60332, TG60334*
	DFT	*30µm min.*
	Performed by	*Shop : Rotor Assembly Area*
2.	Surface Condition	*Primer Painted*
	Coating	*Alkyd Protective Coating Enamel (Grey)*
	Material	*AA27513*
	DFT	*80µm min.*
	Performed by	*Shop : Rotor Assembly Area*
3.	Surface Condition	*Machined*
	Coating	*Anti-Corrosive Agent TRP 1706 #*
	Material	*AA55155*
	DFT	*40µm min.*
	Performed by	*Shop : Rotor Assembly Area*
4.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	

Remarks:
TRP 1706 is to be done on Journal, Seal, Inner & Outer Oil Catcher diameters and entire TE & EE Coupling.

PGMA : 13606
PART : Rotor Assembly

1.	Surface Condition	*Painted*
	Coating	*Alkyd Protective Coating Enamel (Grey)*
	Material	*AA27513*
	DFT	*80µm min.*
	Performed by	*Shop : Assembly Area*
2.	Surface Condition	*Machined*
	Coating	*Anti-Corrosive Agent TRP 1706 #*
	Material	*AA55155*
	DFT	*80µm min.*
	Performed by	*Shop : Assembly Area*
3.	Surface Condition	*Machined*
	Coating	*Turbine Oil Grade VG46 / Lube Oil $*
	Material	*AA57104*
	DFT	-
	Performed by	*Shop : Assembly Area*
4.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	

Remarks:
TRP 1706 is to be done only on Journal, Seal, Inner & Outer Oil Catcher diameters and entire TE & EE Couplings. All other surfaces except Compressor Hub and Blades are to be painted by *Alkyd Protective Coating Enamel (Grey) (AA27513)*.

$ *Turbine Oil Grade VG46 / Lube Oil (AA57104)* is to be applied on Compressor Hub Outer Diameter.

Notes:
All threads, holes and counter bores to be coated with *Lithium Base Grease Grade 3 (AA57401)*.

PGMA : 13606
PART : Moisture Protection Cover

1.	Surface Condition	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint*
	Material	*AA56114*
	DFT	*80µm min.*
	Performed by	*Shop : Fabrication Area/Vendor*
2.	Surface Condition	*Painted*
	Coating	*High Build Intermediate Epoxy Paint*
	Material	*AA56112*
	DFT	*80µm min.*
	Performed by	*Shop : Assembly Area*
3.	Surface Condition	*Painted*
	Coating	*Full Gloss Polyurethane Finishing Paint*
	Material	*AA56126*
	DFT	*80µm min.*
	Performed by	*Shop : Assembly Area*
4.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	

PGMA : 13612
PART : Sliding Pedestal, Guide Pulley* and Support Block

1.	Surface Condition	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint*
	Material	*AA56114*
	DFT	*80µm min.*
	Performed by	*Shop : Fabrication Area/Vendor*
2.	Surface Condition	*Painted*
	Coating	*High Build Intermediate Epoxy Paint*
	Material	*AA56112*
	DFT	*80µm min.*
	Performed by	*Shop : Assembly Area*
3.	Surface Condition	*Painted*
	Coating	*Full Gloss Polyurethane Finishing Paint*
	Material	*AA56126*
	DFT	*80µm min.*
	Performed by	*Shop : Assembly Area*
4.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	

Remarks:
* The pin of the Guide Pulley is not to be painted.

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		जांचकर्ता CHECKED BY	AMIT MITTAL	[signature]	4/6/2020

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PGMA : 13612
PART : Skid Plate

1.	Surface Condition	*Blasted*
	Coating	*Anti-Corrosive Agent TRP 1706*
	Material	*AA55155*
	DFT	*80µm min.*
	Performed by	*Shop : Fabrication Area/Vendor*
2.	Surface Condition	*Cleaned*
	Coating	*EP Weld Primer + Hardener #*
	Material	*TG60332, TG60334*
	DFT	*80µm min.*
	Performed by	*Shop : Assembly Area*
3.	Surface Condition	*Cleaned*
	Coating	*Alkyd Protective Coating Enamel (Grey) #*
	Material	*AA27513*
	DFT	*80µm min.*
	Performed by	*Shop : Assembly Area*
4.	Surface Condition	
	Coating	
	Material	
	DFT	
	Performed by	

Remarks:
Areas to be painted as identified in drawing after removal of TRP 1706.

PGMA : 139410

PART : Air Gap Seal Assembly

		All Surfaces	
1.	Surface Condition	*Cleaned*	
	Coating	*Coating Varnish 2404 or IE 82 / 83 (Red)*	
	Material	*HW27589 / AA27513*	
	DFT	*80µm min.*	
	Performed by	*Shop : Assembly Area*	
2.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

SUPERSEDES INVENTORY NO

SIGN & DATE 12/08/20

INVENTORY NO. P.2628

PGMA : 13907

PART : Baffle Ring Carrier

		Austenitic Nodular Cast Iron Castings	Aluminium Alloy Casting
1.	Surface Condition	*Cleaned un-machined cast surface*	*Cleaned un-machined cast surface*
	Coating	*Coating Varnish 2404 or IE 82 / 83 (Red)*	*Coating Varnish 2404 or IE 82 / 83 (Red) #*
	Material	*HW27589 / AA27513*	*HW27589 / AA27513*
	DFT	*40µm min.*	*40µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
2.	Surface Condition	*Machined*	
	Coating	*Anti-Corrosive Agent TRP 1706*	
	Material	*AA55155*	
	DFT	*40µm min.*	
	Performed by	*Shop : Assembly Area*	
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:

Machined Surfaces of Aluminium castings to be cleaned and remain free of coating.

Notes:

Threaded portion to be coated with *Lithium based Grease Grade 3 (AA57401).*

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		जांचकर्ता CHECKED BY	AMIT MITTAL	Amit	4/6/2020

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INVENTORY NO. P.2628

PGMA : 13907, 13935
PART : Baffle Ring, Insert Cover, Air Baffle Ring, End Shields (Aluminium)

		Austenitic Nodular Cast Iron Castings	Aluminium Alloy Casting
1.	Surface Condition	*Cleaned un-machined cast surface*	*Cleaned un-machined cast surface*
	Coating	*Coating Varnish 2404 or IE 82 / 83 (Red)*	*Coating Varnish 2404 or IE 82 / 83 (Red) #*
	Material	*HW27589 / AA27513*	*HW27589 / AA27513*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
2.	Surface Condition	*Machined*	
	Coating	*Anti-Corrosive Agent TRP 1706*	
	Material	*AA55155*	
	DFT	*40µm min.*	
	Performed by	*Shop : Assembly Area*	
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:
Machined Surfaces of Aluminium castings to be cleaned and remain free of coating.

Notes:
Threaded portion to be coated with *Lithium based Grease Grade 3 (AA57401).*

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		जांचकर्ता CHECKED BY	AMIT MITTAL	[signature]	4/6/2020

PGMA : 13935, 13934
PART : Shaft Seal Assembly & associated Wipers

		Outer Surface	Groove Area
1.	Surface Condition	*Machined*	*Cleaned*
	Coating	*Anti-Corrosive Agent TRP 1706*	*Lithium based Grease Grade 3*
	Material	*AA55155*	*AA57401*
	DFT	*80µm min.*	--
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
2.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Notes:
1. Insulating Items to be coated with *Coating Varnish 2404 or IE 82 / 83 (Red) (HW27589 / AA27513).*
2. Oil Wiper (H2 Side) of Seal Body to be coated with *Coating Varnish 2404 or IE 82 / 83 (Red)*

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		जांचकर्ता CHECKED BY	AMIT MITTAL		4/6/2020

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PGMA : 13935, 13934
PART : Seal Ring

		All Surfaces	
1.	Surface Condition	*Cleaned*	
	Coating	*Turbine Oil Grade VG46 / Lube Oil*	
	Material	*AA57104*	
	DFT	--	
	Performed by	*Shop : Assembly Area*	
2.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Notes:
Seal Rings to be wrapped with wax paper (AA51407), cotton cloth and polythene sheets before dispatch.

REV. NO. 03		निर्माणकर्ता WORKED BY	PRASHANT MISHRA	Prashant	4/6/2020
		जांचकर्ता CHECKED BY	AMIT MITTAL	[signature]	4/6/2020

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INVENTORY NO.: P.2628

PGMA : 13901, 13902

PART : Bearing & associated Wipers

		Steel Surface	Babbit Surface
1.	Surface Condition	*Machined*	*Cleaned*
	Coating	*Anti-Corrosive Agent TRP 1706*	*Lithium based Grease Grade 3. #*
	Material	*AA55155*	*AA57401*
	DFT	*80µm min.*	--
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
2.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:

Holes for Jacking oil to be suitably protected with tape.

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		जांचकर्ता CHECKED BY	AMIT MITTAL	[signature]	4/6/2020

PGMA : 13912, 13934, 13935
PART : Oil Catchers, Labyrinth Rings (Aluminium) & associated Wipers

		Un-machined cast surfaces	Machined Surfaces
1.	Surface Condition	*Cleaned*	*Cleaned*
	Coating	*Coating Varnish 2404 or IE 82 / 83 (Red)*	*Free of coating #*
	Material	*HW27589 / AA27513*	
	DFT	*80µm min.*	
	Performed by	*Shop : Assembly Area*	
2.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:
Machined Surfaces of Aluminium castings to be cleaned and remain free of coating.

REV. NO. 03		निर्माणकर्ता WORKED BY	PRASHANT MISHRA		4/6/2020
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INVENTORY NO. P.2628

PGMA : 13917.
PART : Pipe Assembly for Seal Oil Pressure Measurement

		All Surfaces	
1.	Surface Condition	*Cleaned*	
	Coating	*Turbine Oil Grade VG46 / Lube Oil*	
	Material	*AA57104*	
	DFT	--	
	Performed by	*Shop : Assembly Area*	
2.	Surface Condition	*Machined*	
	Coating	*Anti-Corrosive Agent TRP 1706*	
	Material	*AA55155*	
	DFT	*40μm min.*	
	Performed by	*Shop : Assembly Area*	
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

सामग्री सूची संख्या INVENTORY NO. P.2698

हस्ताक्षर एवं दिनांक SIGN & DATE 14/02/20

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		जांचकर्ता CHECKED BY	AMIT MITTAL	[signature]	4/1/2020

PGMA : 13801, 13807, 13809

PART : Fixing of Foundation Plates, Foundation Covering

		All Surfaces	
1.	Surface Condition	*Blasted*	
	Coating	*Epoxy based Zinc Rich Primer Paint*	
	Material	*AA56114*	
	DFT	*80μm min.*	
	Performed by	*Shop : Fabrication Area*	
2.	Surface Condition	*Machined*	
	Coating	*Anti-Corrosive Agent TRP 1706*	
	Material	*AA55155*	
	DFT	*80μm min.*	
	Performed by	*Shop : Assembly Area*	
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Notes:

Threaded portion to be coated with *Lithium based Grease Grade 3 (AA57401)*.

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INVENTORY NO. P.2628

PGMA : 13938
PART : End Covers of Sealing for Transport of Stator and Packing of Cooler Housing

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	
	Coating	*Epoxy based Zinc Rich Primer Paint*	
	Material	*AA56114*	
	DFT	*100µm min.*	
	Performed by	*Shop : Fabrication Area*	
2.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
3.	Surface Condition	*Painted*	
	Coating	*Refer Table No. 5*	
	Material		
	DFT		
	Performed by	*Shop : Assembly Area*	
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

REV. NO.	निर्माणकर्ता WORKED BY	PRASHANT MISHRA		4/6/2020
03	जांचकर्ता CHECKED BY	AMIT MITTAL		4/6/2020

INVENTORY NO. 02628
SIGN & DATE 12/06/20

PGMA : 13942, 13945, 13925, 13943, 13944, 13949
PART : Tools and Aids, Mounting Bracket, Lifting Devices, Erection Pedestals

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	
	Coating	*Epoxy based Zinc Rich Primer Paint*	
	Material	*AA56114*	
	DFT	*80µm min.*	
	Performed by	*Shop : Fabrication Area*	
2.	Surface Condition	*Machined*	
	Coating	*Anti-Corrosive Agent TRP 1706*	
	Material	*AA55155*	
	DFT	*80µm min.*	
	Performed by	*Shop : Assembly Area*	
3.	Surface Condition	*Painted*	
	Coating	*High Build Intermediate Epoxy Paint*	
	Material	*AA56112*	
	DFT	*80µm min.*	
	Performed by	*Shop : Assembly Area*	
4.	Surface Condition	*Painted*	
	Coating	*Full Gloss Polyurethane Finishing Paint*	
	Material	*AA56126*	
	DFT	*50µm min.*	
	Performed by	*Shop : Assembly Area*	

Notes:
Threaded portion to be coated with *Lithium based Grease Grade 3 (AA57401).*

REV. NO. 03	निर्माणकर्ता WORKED BY	PRASHANT MISHRA		4/6/2020
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SIGN & DATE 12/06/20
INVENTORY NO. P.2628

PGMA : 14931, 14932, 14910, 14936

PART : Seal Oil Unit, Vacuum Tank, Intermediate Oil Tank, Seal Oil Valve Rack

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint #*	*Turbine Oil Grade VG46 / Lube Oil*
	Material	*AA56114*	*AA57104*
	DFT	*80μm min.*	--
	Performed by	*Shop : Fabrication Area*	*Shop : Fabrication Area*
2.	Surface Condition	*Blasted*	*Cleaned*
	Coating	*Epoxy based Zinc Rich Primer Paint #*	*Oil Resistant Synthetic Enamel @*
	Material	*AA56114*	*AA56132*
	DFT	*80μm min.*	*60μm min.*
	Performed by	*Shop : Assembly Area (Block-IV)*	*Shop : Assembly Area (Block-IV)*
3.	Surface Condition	*Machined*	
	Coating	*Anti-Corrosive Agent TRP 1706 $*	
	Material	*AA55155*	
	DFT	*80μm min.*	
	Performed by	*Shop : Assembly Area (Block-IV)*	
4.	Surface Condition	*Painted*	
	Coating	*See Note-1 below*	
	Material		
	DFT		
	Performed by	*Shop : Assembly Area (Block-IV)*	

Remarks:

Leave weld-seams free of any coating. After hydraulic test and testing of Unit, weld-seams to be coated.

$ Machined area to be coated.

@ After hydraulic test and Performance testing of Unit, inner surface to be coated.

Notes:

For final painting scheme refer drawing under PGMA 15100 in respective work-orders.

PGMA : 14907, 14913

PART : Seal Oil Storage Tank, Liquid Detector Rack

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint #*	*Turbine Oil Grade VG46 / Lube Oil*
	Material	*AA56114*	*AA57104*
	DFT	*80μm min.*	--
	Performed by	*Shop : Fabrication Area*	*Shop : Fabrication Area*
2.	Surface Condition	*Blasted*	*Cleaned*
	Coating	*Epoxy based Zinc Rich Primer Paint #*	*Turbine Oil Grade VG46 / Lube Oil @*
	Material	*AA56114*	*AA57104*
	DFT	*80μm min.*	--
	Performed by	*Shop : Assembly Area (Block-IV)*	*Shop : Assembly Area (Block-IV)*
3.	Surface Condition	*Machined*	
	Coating	*Anti-Corrosive Agent TRP 1706 $*	
	Material	*AA55155*	
	DFT	*80μm min.*	
	Performed by	*Shop : Assembly Area (Block-IV)*	
4.	Surface Condition	*Painted*	
	Coating	*See Note-1 below*	
	Material		
	DFT		
	Performed by	*Shop : Assembly Area (Block-IV)*	

Remarks:

Leave weld-seams free of any coating. After hydraulic test, weld-seams to be coated.

@ After hydraulic test, inner surface to be dried and coated.

$ Machined area to be coated.

Notes:

For final painting scheme refer drawing under PGMA 15100 in respective work-orders.

REV. NO. 03		निर्माणकर्ता WORKED BY	PRASHANT MISHRA	[signature]	4/6/2020
		जांचकर्ता CHECKED BY	AMIT MITTAL	[signature]	4/6/2020

उत्पाद मानक (हीप : हरिद्वार)

PRODUCT STANDARD (HEEP: HARIDWAR)

0912.015

PGMA : 14917, 14925
PART : Gas Unit, N2 Distributor, H2 Distributor, CO2 Distributor

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	*Cleaned & Dried*
	Coating	*Epoxy based Zinc Rich Primer Paint #*	--
	Material	*AA56114*	--
	DFT	*80µm min.*	--
	Performed by	*Shop : Fabrication Area*	*Shop : Fabrication Area*
2.	Surface Condition	*Blasted*	*Cleaned & Dried*
	Coating	*Epoxy based Zinc Rich Primer Paint #*	--
	Material	*AA56114*	--
	DFT	*80µm min.*	--
	Performed by	*Shop : Assembly Area (Block-IV)*	*Shop : Assembly Area (Block-IV)*
3.	Surface Condition	*Machined*	
	Coating	*Anti-Corrosive Agent TRP1706 $*	
	Material	*AA55155*	
	DFT	*80µm min.*	
	Performed by	*Shop : Assembly Area (Block-IV)*	
4.	Surface Condition	*Painted*	
	Coating	*See Note-1 below*	
	Material		
	DFT		
	Performed by	*Shop : Assembly Area (Block-IV)*	

Remarks:
Leave weld-seams free of any coating. After hydraulic test, weld-seams to be coated.
@ After Pneumatic test, inner surface to be cleaned.
$ Machined area to be coated.

Notes:
For final painting scheme refer drawing under PGMA 15100 in respective work-orders.

REV. NO.		निर्माणकर्ता WORKED BY	PRASHANT MISHRA		4/6/2020
03		जांचकर्ता CHECKED BY	AMIT MITTAL		4/6/2020

PGMA : 15006, 15302, 15314, 15315
PART : PW Pipe Line*, PW Tank, PW System, PW Cooler Unit

		Outer Surface	Inner Surface
1.	Surface Condition	*Cleaned & Dried*	*Cleaned & Dried*
	Coating	--	--
	Material	--	--
	DFT	--	--
	Performed by	*Shop : Fabrication Area*	*Shop : Fabrication Area*
2.	Surface Condition	*Blasted*	*Cleaned & Dried*
	Coating	*Epoxy based Zinc Rich Primer Paint #*	--
	Material	*AA56114*	--
	DFT	*80µm min.*	--
	Performed by	*Shop : Assembly Area (Block-IV)*	*Shop : Assembly Area (Block-IV)*
3.	Surface Condition	*Machined*	
	Coating	*Anti-Corrosive Agent TRP1706 $*	
	Material	*AA55155*	
	DFT	*80µm min.*	
	Performed by	*Shop : Assembly Area (Block-IV)*	
4.	Surface Condition	*Painted*	
	Coating	*See Note-1 below*	
	Material		
	DFT		
	Performed by	*Shop : Assembly Area (Block-IV)*	

Remarks:
Leave weld-seams free of any coating. After hydraulic test, weld-seams to be coated.
@ After hydraulic test, inner surface to be cleaned and dried.
$ Machined area to be coated.
* PW Pipe Lines (15006) to be coated with Epoxy based Zinc Rich Primer Paint (AA56114) (*80µm min.) in Fabrication Area.*

Notes:
For final painting scheme refer drawing under PGMA 15100 in respective work-orders.

PGMA : 14201, 14202
PART : Exciter Stator Frame

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint*	*Epoxy based Zinc Rich Primer Paint*
	Material	*AA56114*	*AA56114*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Fabrication Area*	*Shop : Fabrication Area*
2.	Surface Condition	*Painted*	*Painted*
	Coating	*Epoxy based Zinc Rich Primer Paint*	*Coating Varnish 2404 or IE 82 / 83 (Red)*
	Material	*AA56114*	*HW27589 / AA27513*
	DFT	*80µm min.*	*40µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
3.	Surface Condition	*Machined*	
	Coating	*Anti-Corrosive Agent TRP 1706*	
	Material	*AA55155*	
	DFT	*80µm min.*	
	Performed by	*Shop : Assembly Area*	
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

PGMA : 14601
PART : PMG Pilot Exciter, PMG Frame (Standard Design)

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint*	*Epoxy based Zinc Rich Primer Paint*
	Material	*AA56114*	*AA56114*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Fabrication Area*	*Shop : Fabrication Area*
2.	Surface Condition	*Painted*	*Painted*
	Coating	*Epoxy based Zinc Rich Primer Paint*	*Coating Varnish 2404 or IE 82 / 83 (Red)*
	Material	*AA56114*	*HW27589 / AA27513*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Notes:
There are 2 possibilities for protecting the Pilot Exciter.
Variation 1 – Standard Design
Variation 2 – is only used with TVPI PMG.

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PGMA : 14601
PART : Pilot Exciter Frame (with TVPI)

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted / Cleaned*	*Blasted / Cleaned*
	Coating	*Coating Varnish 2404 or IE 82 / 83 (Red)*	*Coating Varnish 2404 or IE 82 / 83 (Red)*
	Material	*HW27589 / AA27513*	*HW27589 / AA27513*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
2.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Notes:

1. There are 2 possibilities for protecting the Pilot Exciter.

   Variation 1 – Standard Design.
   Variation 2 – is only used with TVPI PMG.

2. Refer drawing information. Protect contact surface with *Silicon Grease (TG89712).*

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PGMA : 14203
PART : Stator Core
Main exciter

		Outer Surface	Inner Surface
1.	Surface Condition	*Cleaned*	*Cleaned*
	Coating	*Coating Varnish 2404 or IE 82 / 83 (Red) #*	*Coating Varnish 2404 or IE 82 / 83 (Red)#*
	Material	*HW27589 / AA27513*	*HW27589 / AA27513*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
2.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:
Before assembly including end laminations in the area of Clamp Ring.

PGMA : 14601
PART : Stator Core
Pilot Exciter

		Outer Surface	Inner Surface
1.	Surface Condition	*Cleaned*	*Cleaned #*
	Coating	*Coating Varnish 2404 or IE 82 / 83 (Red) #*	*Coating Varnish 2404 or IE 82 / 83 (Red) #*
	Material	*HW27589 / AA27513*	*HW27589 / AA27513*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
2.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:
After installation.

PGMA : 14205
PART : Main Pole Coil, Field Coil and Connections

		Outer Surface	Inner Surface
1.	Surface Condition	*Cleaned*	*Cleaned*
	Coating	*Coating Varnish 2404 or IE 82 / 83 (Red) #*	*Coating Varnish 2404 or IE 82 / 83 (Red) $*
	Material	*HW27589 / AA27513*	*HW27589 / AA27513*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
2.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:
Before installation (Poles).
$ After installation.

PGMA : 14601
PART : Stator Winding
Pilot Exciter

		Outer Surface	Inner Surface
1.	Surface Condition	*Cleaned*	
	Coating	*Coating Varnish 2404 or IE 82 / 83 (Red) #*	
	Material	*HW27589 / AA27513*	
	DFT	*80μm min.*	
	Performed by	*Shop : Assembly Area*	
2.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:
After installation.

PGMA : 14404
PART : Air Guide Cover, End cover

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint*	*Epoxy based Zinc Rich Primer Paint*
	Material	*AA56114*	*AA56114*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Fabrication Area*	*Shop : Fabrication Area*
2.	Surface Condition	*Painted*	*Painted*
	Coating	*Epoxy based Zinc Rich Primer Paint*	*Epoxy based Zinc Rich Primer Paint*
	Material	*AA56114*	*AA56114*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
3.	Surface Condition	*Machined*	
	Coating	*Anti-Corrosive Agent TRP 1706*	
	Material	*AA55155*	
	DFT	*80µm min.*	
	Performed by	*Shop : Assembly Area*	
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:
After machining.

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PGMA : 14404

PART : Seal Wall, End Shield

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint*	*Epoxy based Zinc Rich Primer Paint*
	Material	*AA56114*	*AA56114*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Fabrication Area*	*Shop : Fabrication Area*
2.	Surface Condition	*Painted*	*Painted*
	Coating	*Epoxy based Zinc Rich Primer Paint*	*Epoxy based Zinc Rich Primer Paint*
	Material	*AA56114*	*AA56114*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Notes:

Insulating Rings: *Coating Varnish 2404 or IE 82 / 83 (Red) (HW27589 / AA27513): 40µm min.*

PGMA : 14305, 14504

PART : Blower Housing and Brush Carriers, Earth Fault Monitoring

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	
	Coating	*Epoxy based Zinc Rich Primer Paint*	
	Material	*AA56114*	
	DFT	*80μm min.*	
	Performed by	*Shop : Fabrication Area*	
2.	Surface Condition	*Painted*	
	Coating	*$, #*	
	Material	*$, #*	
	DFT	*80μm min.*	
	Performed by	*Shop : Assembly Area*	
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:

Stator Parts: *Epoxy based Zinc Rich Primer Paint (AA56114): 80μm min.*
Attachments: *Coating Varnish 2404 or IE 82 / 83 (Red) (HW27589 / AA27513): 80μm min.*

$ Insulating parts: *Coating Varnish 2404 or IE 82 / 83 (Red) (HW27589 / AA27513): 40μm min.*

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सामग्री सूची संख्या INVENTORY NO. P-2628 हस्ताक्षर एवं दिनांक SIGN & DATE 12/06/20

उत्पाद मानक (हीप : हरिद्वार)

PRODUCT STANDARD (HEEP: HARIDWAR)

0912.015

PGMA : 14406
PART : Fuse Monitoring

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	
	Coating	*Epoxy based Zinc Rich Primer Paint*	
	Material	*AA56114*	
	DFT	*80µm min.*	
	Performed by	*Shop : Fabrication Area*	
2.	Surface Condition	*Painted*	
	Coating	*Epoxy based Zinc Rich Primer Paint*	
	Material	*AA56114*	
	DFT	*80µm min.*	
	Performed by	*Shop : Assembly Area*	
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:
Stator Parts: *Epoxy based Zinc Rich Primer Paint (AA56114): 80µm min.*
Attachments: *Alkyd Protective Coating Enamel (Grey) (AA27513): 80µm min.*

$ Insulating parts: *Coating Varnish 2404 or IE 82 / 83 (Red) (HW27589 / AA27513): 40µm min.*

निर्माणकर्ता WORKED BY	PRASHANT MISHRA	Prashant	4/6/2020
जांचकर्ता CHECKED BY	AMIT MITTAL	Amit	4/6/2020

PGMA: 14301, 14303, 14304, 14305, 14307, 14309, 14310
PART: Exciter Rotor, Slip Ring Shaft Assy.

Notes:

1. The rotor is divided into various coating sections or area for surface treatment. The surface must be free from grease and cleaned before treatment.
2. Balancing grooves must definitely be kept free of paint.
3. Drawing data is to be observed with the measuring areas.
4. The journal areas are treated according to TG50001 and dispatched according to TG50002 (for separately dispatched rotors).
5. Slip Ring surfaces of Slip Ring Shaft Assembly to be treated as per TG50001.

Surface treatment:

a) Shaft in the area of air guide cover and three phase AC leads and inner surface of diode wheels before installation of items:

Insulating Varnish: Alkyd Protective Coating Enamel (Grey) (AA27513) - 80µm.

b) Insulating Rings and Parts treated as per TG-WIS-0666:

Insulating Varnish: Alkyd Protective Coating Enamel (Grey) (AA27513) - 80µm.

c) Blower and Permanent Magnet Poles after installation:

Insulating Varnish: Alkyd Protective Coating Enamel (Grey) (AA27513) - 80µm.

d) Wound Armature (except Outer surface), area of AC leads, Diode Wheel outer surface and Slip Rings after installation:

Insulating Varnish: Alkyd Protective Coating Enamel (Grey) (AA27513) - 80µm.

e) Outer surface of Wound Armature:

Insulating Varnish: Red Enamel 2404 (HW27589) - 80µm.

f) Rest machined surfaces of rotor like coupling, steady, journal, run-out measuring surfaces etc.:

Paint: Anti-Corrosive Agent TRP 1706 (AA55155) - 80µm.

Performed by : *Shop Exciter Area / Assembly Area*

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REV. NO.					
03		निर्माणकर्ता WORKED BY	PRASHANT MISHRA		4/6/2020
		जांचकर्ता CHECKED BY	AMIT MITTAL		4/6/2020

PGMA : 14305, 14401, 14405, 14508,14509
PART : Base Frame and Accessories

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint*	*Epoxy based Zinc Rich Primer Paint*
	Material	*AA56114*	*AA56114*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Fabrication Area*	*Shop : Fabrication Area*
2.	Surface Condition	*Painted*	*Painted*
	Coating	*Epoxy based Zinc Rich Primer Paint*	*Epoxy based Zinc Rich Primer Paint*
	Material	*AA56114*	*AA56114*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
3.	Surface Condition	*Machined*	*Machined*
	Coating	*Anti-Corrosive Agent TRP 1706*	*Anti-Corrosive Agent TRP 1706*
	Material	*AA55155*	*AA55155*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Notes:
Under surface of base frame, which will be cast in concrete later, is to remain free of paint. See also drawing details.

PGMA : 14214, 14305
PART : Bearing Pedestal

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint*	*Turbine Oil Grade VG46 / Lube Oil*
	Material	*AA56114*	*AA57104*
	DFT	*80µm min.*	--
	Performed by	*Shop : Fabrication Area*	*Shop : Fabrication Area*
2.	Surface Condition	*Painted*	*Oiled*
	Coating	*Epoxy based Zinc Rich Primer Paint*	*Turbine Oil Grade VG46 / Lube Oil #*
	Material	*AA56114*	*AA57104*
	DFT	*80µm min.*	--
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
3.	Surface Condition	*Machined*	
	Coating	*Anti-Corrosive Agent TRP 1706*	
	Material	*AA55155*	
	DFT	*80µm min.*	
	Performed by	*Shop : Assembly Area*	
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:
Repeat preservation while preparing for dispatch.

PGMA : 14214, 14305
PART : Bearing Shell (Individual dispatch)

		Outer Surface	Inner Surface
1.	Surface Condition	*Machined*	*Cleaned*
	Coating	*Anti-Corrosive Agent TRP 1706*	*Lithium based Grease Grade 3. #*
	Material	*AA55155*	*AA57401*
	DFT	*80µm min.*	--
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
2.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

Remarks:
Holes for Jacking oil to be suitably protected with tape.

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INVENTORY NO. 0.2628

SIGN & DATE 12/06/20

PGMA : 14403, 14305
PART : Covers

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	*Blasted*
	Coating	*Epoxy based Zinc Rich Primer Paint*	*Epoxy based Zinc Rich Primer Paint*
	Material	*AA56114*	*AA56114*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Fabrication Area*	*Shop : Fabrication Area*
2.	Surface Condition	*Painted*	*Painted*
	Coating	*Epoxy based Zinc Rich Primer Paint*	*Epoxy based Zinc Rich Primer Paint*
	Material	*AA56114*	*AA56114*
	DFT	*80µm min.*	*80µm min.*
	Performed by	*Shop : Assembly Area*	*Shop : Assembly Area*
3.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

REV. NO. 03		निर्माणकर्ता WORKED BY	PRASHANT MISHRA	Prashant	4/6/2020
		जांचकर्ता CHECKED BY	AMIT MITTAL	Amit	4/6/2020

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सामग्री सूची संख्या को अधिक्रमित करता है SUPERSEDES INVENTORY NO.

डिजाइन एवं हस्ताक्षर SIGN & DATE

PGMA : 14510, 14305

PART : Transport Bearing and Protective Cover

		Outer Surface	Inner Surface
1.	Surface Condition	*Blasted*	
	Coating	*Epoxy based Zinc Rich Primer Paint*	
	Material	*AA56114*	
	DFT	*80μm min.*	
	Performed by	*Shop : Fabrication Area*	
2.	Surface Condition	*Painted*	
	Coating	*Epoxy based Zinc Rich Primer Paint*	
	Material	*AA56114*	
	DFT	*80μm min.*	
	Performed by	*Shop : Assembly Area*	
3.	Surface Condition	*Machined*	
	Coating	*Anti-Corrosive Agent TRP 1706*	
	Material	*AA55155*	
	DFT	*80μm min.*	
	Performed by	*Shop : Assembly Area*	
4.	Surface Condition		
	Coating		
	Material		
	DFT		
	Performed by		

REV. NO. 03		निर्माणकर्ता WORKED BY	PRASHANT MISHRA	[signature]	4/6/2020
		जांचकर्ता CHECKED BY	AMIT MITTAL	[signature]	4/6/2020

सामग्री सूची संख्या INVENTORY NO. P2628

हस्ताक्षर एवं दिनांक SIGN & DATE [signature] 12/06/20

Table No. 4

List of Materials

S. No.	Description of Material	Material Specification
1.	Epoxy Based Zinc Rich Primer Paint	AA56114
2.	High Build Intermediate Epoxy Paint	AA56112
3.	Full Gloss Polyurethane Finishing Paint (liquid)	*AA56126*
4.	Anti-Corrosive Agent TRP 1706 Rust Preventive, Drying Type - Pigmented	AA55155
5.	Insulating Enamel - Coating varnish 2404	TG60140 HW27589
6.	Alkyd Protective Coating Enamel IE 82 / 83 (Red & Grey)	AA27513
7.	EP Weld Primer	TG60332
8.	Hardener for EP Weld Primer	TG60334
9.	EP Filler	TG60333
10.	Silicon Release Compound	TG89712
11.	Industrial Grease / Lithium based grease Regular Type Grade: 3	AA57401
12.	Turbine Oil Grade VG46 / Lube Oil	AA57104
13.	Motor Gasoline Petrol Unleaded	AA57804
14.	Petroleum Hydrocarbon Solvent (White Spirit)	AA56701
15.	Industrial Toluole	AA56702
16.	Xylole	AA56703
17.	General Purpose Thinner	-
18.	Volatile Corrosion Inhibitor (VCI) Treated Paper	AA51406
19.	Waxed Greased Proof Paper	AA51407
23.	Polyethene	AA51408
20.	Cotton cloth	-
21.	Polishing sand paper	-
22.	Silica gel	AA55619

Table No. 5

Final Painting of Stator Body and Cooler Housing including all Sealing Covers

Sealing for Transport and Packing of Cooler Housing including all Sealing Covers		
		Outer Surface
1.	Surface Condition	*Painted*
	Coating	*Epoxy Based Zinc Rich Primer Paint*
	Material	*AA56114*
	DFT	*100μm min.*
	Performed by	*Shop : Assembly Area*
2.	Surface Condition	*Painted*
	Coating	*High Build Intermediate Epoxy Paint*
	Material	*AA56112*
	DFT	*100μm min*
	Performed by	*Shop : Assembly Area*
3.	Surface Condition	*Painted*
	Coating	*Full Gloss Polyurethane Finishing Paint (liquid)*
	Material	*AA56126*
	DFT	*50μm min*
	Performed by	*Shop : Assembly Area*
	Total DFT	*250μm min*

Notes:
Technical Requirements as per drawing PGMA 15100 under respective work orders.

Table No. 6

Painting Scheme (For information only)

Painting Scheme as per AA0674123		8
Surface Preparation Grade / Environment Condition		*SA 2 ½ Industrial & Coastal*
Primer Paint	Material	*Epoxy Zinc Rich Primer Paint*
	Material Spec.	*AA56114*
	No. of Coats	*2*
	DFT	*100µm min.*
Intermediate Paint	Material	*High Build Intermediate Epoxy Paint*
	Material Spec.	*AA56112*
	No. of Coats	*1*
	DFT	*100µm min*
Finish Coat	Material	*Full Gloss Polyurethane Finishing Paint (liquid)*
	Material Spec.	*AA56126*
	No. of Coat	*1*
	DFT	*30µm min*
	Total DFT	*230µm min*

प्रपत्र डीजी ४१(डी) FORM DG 41(D)

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भेल एच ई एल	संशोधन सूचना संख्या CHANGE ADVICE NO. (1)	जारीकर्ता विभाग ISSUING DEPTT. (2)	उत्पाद का प्रकार TYPE OF PRODUCT (3)	जीएमएस/जीआरएसपी/सीबोम सं GMS / GRSP /CBOM No. (4)	मुद्रण वितरण दिनांक PRINT DELIVERY DATE (5)	स्वीकृतिकर्ता APPROVED BY (6)
	TGE-19-64	TGE	TURBOGENERATOR			RAJEEV KUMAR SHARMA

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	नाम NAME	हस्ताक्षर SIGN	दिनांक DATE
निर्माणकर्ता WORKED BY (17)	DEVESH TEWARI	Devesh 6/11/19	
जांचकर्ता CHECKED BY (18)	AMIT MITTAL	Amit 6/11/19	
मानक नियंत्रण STD.CONTROL (19)			

AGREED सहमति (20)

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		6/11/19				

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निस्तारणकर्ता RELEASED BY STANDARDS (21)	संदीप गुप्ता		6/11/19
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प्राप्त कर्ता RECEIVED BY (CTA) (24)	मनोज		12/06/20
पृष्ठ सं SHEET NO (25)	कुल पृष्ठ TOTAL SHEETS (26)		

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Annexure - 1

TECHNICAL SPECIFICATION
FOR
PAINTING & COATING
OF
EQUIPMENT & STRUCTURES

CONTENTS

1.0 INTRODUCTION

1.1 Scope

This specification covers the minimum requirements governing surface preparation, selection, application & inspection of the protective coating system to be used on the interior and exterior exposed surfaces of all types of structural steel placed in thermal power plant to get high durability (above 15 years) in C5-M, C-4 & C-3 environment classified according to ISO 12944- 2.

Individual equipment specifications and /or drawings, when furnished, are to be used withthese specifications. If conflict exists, the individual specifications and/or drawings shall govern.

Since maintenance –painting requirements are usually different from that necessary for newconstruction, salient points for each will likewise be addressed separately.

1.2 Definitions

The following definitions shall apply:

COMPANY	shall mean Adani or the designated representative.
CONTRACTOR	shall mean the party contracted to perform the work in accordance withthe drawings, specifications & work scope.

2.0 CODES AND STANDARDS

2.1 Mandatory Statutory Requirements

This document has been prepared to the International Standards detailed within. The CONTRACTOR shall ensure that the Work is executed in accordance with internationalstandards, Statutory & Regulatory requirements as per system application.

2.2 Codes and Standards & Regulations

The requirements of the latest published versions of the following listed Codes, Recommended Practices. Specifications and standards shall be meet

2.2.1 Steel Structure Painting Council (SSPC)

SSPC-PA1	:	Shop, Field and Maintenance Painting of Steel.
SSPC-PA2	:	Measurement of Dry Coating Thickness with Magnetic Gauges
SSPC-SP1	:	Solvent Cleaning
SSSC-SP2	:	Hand Tool Cleaning
SSPC-SP3	:	Power Tool Cleaning
SSPC-SP5	:	White Metal Blast Cleaning

SSPC-SP6	:	Commercial Blast Cleaning
SSPC-SP7	:	Brush –Off Blast Cleaning
SSPC-SP10	:	Near White Blast Cleaning
SSPC-SP11	:	Power Tool Cleaning to bare metal
SSPC-SP12	:	Surface Preparation & cleaning of Steel and Other Hard Material by High and Ultra High Pressure Water Jetting Prior to recoating
SSPC-AB1	:	Mineral and Slag Abrasive
SSPC-SP20	:	Zinc rich coating Type-I (Inorganic) & Type-II (Organic)
SSPC-SP COM:		Surface Preparation and Abrasives Commentary, SSPC Painting Manual, Volume 2, "Systems and Specifications"
SSPC VIS-1	:	Visual Standard for Abrasive Blast Cleaned Steel
SSPC Vol.2	:	SSPC Painting Manual. Other equivalent Swedish, BS standard also applicable.

2.2.2 American Society for Testing and Materials (ASTM)

ASTM D4228:		Standard practice for qualification of coating Applicators for application of coating on steel surfaces.
ASTM B117	:	Salt Spray Test
ASTM G50	:	Standard practice for conducting atmospheric corrosion test
ASTM G53 (Part-B):		Weathering Test
ASTM D520	:	Zinc Dust (Metallic Zinc Powder)
ASTM D523	:	Specification for Gloss
ASTM D1200:		Viscosity
ASTM D1640:		Drying time
ASTM D1653:		Standard test method for evaluation of painted or quoted specimens subject to corrosive environment.
ASTM D2247:		Relative Humidity Test
ASTM D2697:		Volume of Solids
ASTM D4060:		Abrasion Resistance of Coating
ASTM D3359:		Standard test method for measuring adhesion by tape test
ASTM D5894:		Standard test method for evaluating drying or Curing during film. Corrosion resistance under Cyclic condensation/UV

2.2.3 Indian Standards

IS 5	:	Colours for Ready Mixed Paints and Enamels

2.2.4 International Standards Organization

ISO –8501	:	International Standard for Preparation of Surface
ISO-8502	:	Preparation of steel substrates before application of Paints & related products
ISO-8502 (1 to 10)	:	Tests for the assessment for surface cleanliness
ISO –8504	:	Preparation of steel substrates before application of Paints and related products-Surface preparation method Part – 1, 2 & 3
ISO 14713	:	Protection against corrosion of iron and steel structure-Zinc and aluminum coating.
ISO 4624	:	Adhesion test of paint
ISO 12944	:	Corrosion protection of steel structure by protective paint system part 1 to 8
ISO 4628	:	Evaluation of degradation of paint coating
ISO 4628-6	:	Paints & varnishes - Evaluation of degradation of paint coatings - Designation of intensity, quantity & size of common types of defect - Part 6: Rating of degree of chalking by type method.

2.2.5 Occupational Safety and Health Act

OSHA : Occupational Safety and Health Act

2.2.6 NACE Standards

NACE RP0188:	Discontinuity (Holiday) Testing of Protective coating
NACE RP0287:	Surface profile Measurement of abrasive blast Cleaned steel surfaces using a replica tape.

2.2.7 RAL COLOUR CHART

3.0 SURFACE PREPARATION

3.1 General

The surface preparation procedures and requirements except for galvanizing and Cadmium plating shall be in accordance with Steel Structural Painting Council SSPC and ISO–8501.

The method of surface preparation used shall be compatible with the priming coat of Paint and be one or a combination of the following:-

1. Solvent Cleaning- SSPC-SP1
2. Hand Tool Cleaning - SSPC-SP2

3. Power Tool Cleaning - SSPC-SP3
4. Blast Cleaning refer 3.2 as below

All fabrication and assembly shall be completed before surface preparation begins.
Blast and prime of structural items prior to assembly will be permitted. All bolt holes shall be drilled and their edges smoothed prior to blasting.

3.2 Requirements of Blasting

Only dry blasting procedures are allowed. Definitions and requirements for, the various methods of surface cleaning are given below:

A) White Metal Blast: As per SSPC SP5, & visual reference Sa3 as per ISO 8501-1.
B) Near-White Blast: As per SSPC SP10, & visual reference Sa2.5as per ISO 8501-1.
C) Commercial Blast: As per SSPC SP6, & visual reference Sa2 asper ISO 8501-1.
D) Brush-off Blast: As per SSPC SP7, & visual reference Sa1 as per ISO 8501-1

3.3 Pre Blasting preparation

3.3.1 Rough Edges

Sharp edges, fillets, corners and welds shall be rounded or smoothened by grinding (minimum radius 2 mm).Hard surface layers (e.g. resulting from flame cutting) shall be removed by grinding prior to blast cleaning.
All surfaces should be washed with clean fresh water prior to blast cleaning.
Any major surface defects, particularly surface laminations or scabs detrimental to the protective coating system shall be removed by suitable dressing. Where such defects have been revealed during blast cleaning, and dressing has beenperformed, the dressed area shall be re-blasted to the specified standard. Surfacepores, cavities etc. shall be removed by suitable dressing or weld repair.

3.3.2 Weld Flux and Spatter

Weld flux, slag spatter, slivers etc. shall be ground smooth before blasting.
Welding surface imperfections shall be removed and surface profile shallbe prepared as per ISO 12944-3.

Any surface on which grinding is done shall be spot blast cleaned orpower tool cleaned to obtain required anchor pattern.
All welds shall be inspected and if necessary repaired prior to final blastcleaning of the area.

3.3.3 Surface Cleaning

Prior to blasting, all deposits or grease or oil shall be removed from thesurface in accordance with SSPC-SP1 Solvent Cleaning usingbiodegradable water soluble cleaner.

3.3.4 Chemical Contamination

All chemical contamination shall be neutralized and/or flushed off prior to any other surface preparation.

3.4 Blasting Operations

3.4.1 Weather conditions

Blast cleaning shall not be done on any surface that is moist, or that may become moist, before the application of a primer.

Blasting is not permitted when:-

a) The temperature of steel is less than 3°C above the dew point, as measured by a sling hydrometer,
b) The relative humidity of the air is more than 60 %.

Relative humidity shall be maintained by an adequately designed Dehumidification systemand the record shall be maintained.

3.4.2 Preliminary Blasting

If blasting is performed at night, the surfaces shall be re-blasted the following day to provide the specified surface preparation standard and the anchor profile required for the specified coating system.

3.4.3 Blasting and Painting

Blasting shall not be done adjacent to painting operations or coated surfaces that are not fully dry. Blasting shall overlap previously coatedsurfaces by at least 150 mm.
Blasting and Painting shall be done in closed chamber only.
The record of atmospheric conditions (Temp, RH, Due Point) before the blasting & painting shall be maintained.
The use of silica sand is strictly prohibited

3.4.4 Post – Blasting Procedure

The surface to be coated shall be clean, dry, free from oil/grease, and have the specified roughness and cleanliness until the first coat is applied.

Blast cleaned steel surfaces shall not be touched by bare hands.

The blast cleaned surface shall be rendered dust free and coated with the specified primer a soon as possible to avoid formation of oxidation on the surface, but in any case, four one from the time of blasting, and at least one hour prior to sundown of the day it is blasted and before any rusting occurs.

Any steel surface not primed within these limits or that is wet shall be reblasted.

No acid washes or other cleaning solutions or solvents shall be used on metalsurfaces after they are blasted. This includes washes Intended to prevent rusting.

All areas around the intended paint surface shall be cleaned of blast material prior tocoating. Drains shall be purged of blast material and flushed.

Biodegradable water – soluble cleaning solution used to clean previously painted surfaces shall not lift softens or otherwise damages the existingcoating.

For determination of chloride surface; relavent ISO 8502 part 2 & 5 shall be applicable. Chloride contamination shall be checked using-SCM 400 / brestle patches / quanta strips. Maximum permissible limit is 10 micro gram / sq.cm. for external surface & 5micro gram / sq.cm. for internal of vessels.

3.5 Blasting Equipment

3.5.1 Compressed Air

The air compressor shall be capable of maintaining a minimum of 700kpa (7 kg/cm 2 or 100 psi) air pressure at each blasting nozzle. The compressed air supply shall be free of water and oil. Adequate separators and traps shall be provided on the equipment, which shallbe regularly purged of water and oil to maintain efficiency.

3.5.2 Nozzle

The nozzle shall be a 10 mm (maximum) internal diameter venture style nozzle.

3.5.3 Power Tools

Power tools may be used to obtain a metal surface finish as per SSPC SP11 where blasting is not possible, or on items which might be damaged by blasting.

3.5.4 Shot Blasting Equipment

Shot blasting equipment may be used for specific applications. Shot shall be changed as required to maintain the angular profile requirement.

3.6 Blasting Abrasive

3.6.1 Abrasive

The abrasive shall be as per SSPC-AB-1. The abrasives shall be copper slag, steel balls shall be free of contamination of dust and chlorides to produce the required anchor profile and graded as to be free from clay, silt or other matter likely tobecome embedded in the steel surface. Abrasives which have atendency to shatter and adhere or embed in the steel surface shall notbe acceptable. Recycled abrasive shall not be used. The use of sand is prohibited

3.6.2 Shot Blasting Material

Shot blasting material shall pass through a G-16 to G-40 mesh screen. At least 25% to 30% steel grit shall be mixed with the graded shot to remove any rust, scale or other impurities pined into the surface. Shot blasting material is limited to iron, steel or synthetic shot which is applied by compressed air nozzles or centrifugal wheels. Shot blasting material shall be checked at least two times a week for replacement of abraded material.

4.0 COATING APPLICATION

4.1 General Application

All application, inspection and safety procedures shall be carried out inaccordance with SSPC Painting Manuals, Vol. 1 Chapter 14.2 and Vol. 2 Chapter 5) and as set out below.

4.1.1 Supply and Storage

All coatings shall be furnished, mixed and applied in accordance with manufacturer's recommendations and as specified here in. Mixing of different

Manufacturer's coatings or applications on the same surface are not permitted.

All coating materials and thinners shall be in original, unopened containers being the manufacturers label batch numbers and instructions. For materials having a limited shelf life, the date of manufacture and the length of life shall be shown. Materials older than their stated shelf life shall not be used.

Materials shall be stored in accordance with the manufacturers Recommendations.

Coating materials that have gelled, other than thixotropic materials or materials that have deteriorated during storage shall not be used.

4.1.2 Pot Life

If the coating requires the addition of a catalyst, the manufacturer's Recommended pot life for the application conditions shall not be exceeded.

When the pot life is reached, the spray pot shall be emptied, cleaned and a new material catalyzed. Manufacturer's recommendations to be followed

4.1.3 Mixing

Mixing and thinning directions as furnished by the manufacturer shall be followed. Only thinners specified by the manufacturer shall be used.

All coating materials shall be stirred with a power mixer use, until the pigments, vehicles and catalysts are thoroughly mixed and then strained while being poured into the spray pot. During application the materials shall be agitated according to the manufacturer's recommendations.Different brands or types of paints shall not be intermixed.

4.2. Cleanliness

All Surfaces shall be clean free from dust and dry. Any blast cleaning dust orgrit remaining on the surfaces shall be removed by means of compressed air before priming or application of any coating. Any surface with a rust bloomshall be re-blasted as per ISO: 8504.

4.2.1 Temperature

Coating shall only be applied when the temperature of the steel is atleast 3°C above the dew point;ambient air temperature must be withinthe limits specified by the manufacturer.

4.2.2 Weather Conditions

No coatings shall be applied during fog, mist or rain or when humidity is not greater than 60% or on to wet surfaces. In case the minimumtemperature at the fabrication yard is below 5 deg C, the contractor shallpropose alternate coating procedure for Company's approval at thebinding stage itself.

The company has the right to suspend application of coating whendamage to the coating may result from actual or impeding weathercondition.

4.2.3 Coats

Each coat shall be applied uniformly and completely over the entiresurface. Each coat shall be allowed to dry for the time specified by themanufacturer before the application or a succeeding coat. To reducethe possibility of intercoat contamination and to assure proper adhesionbetween successive coats, all coats shall be applied as soon aspossible after the minimum specified drying time of the preceding coat.

4.2.4 Brush Application (Stripe Coating)

A stripe coat shall be applied by brush or roller after the prime coat has been applied. The stripe coat shall be applied to edges, corners,welding seams, bolt holes, back side of piping, stiffeners, vent anddrain holes, notches and any other area that is difficult to reach byspray gun.

4.2.5 Finish Coat

An additional layer of finish coat shall be hand brushed at edges,corners, welds and hard-to spray areas to eliminate holidays in the finalcoats.

4.2.6 Field Welds

No coating shall be applied within 150 mm of edges prepared eitherfor field welds or to surfaces waiting non-destructive testing.

4.2.7 Inorganic Zinc Primer

It is preferred that intermediate/top coat for inorganic zincprimer coats be applied within minimum of seven (7) days after theprimer coat.

4.3 Spray Application

4.3.1 Equipment

(a) All equipment to be used for spray applications shall beinspected and tested before application begins.

(b) All equipment shall be maintained in good working order andshall be equal to that described in the manufacturer'sinstructions.

(c) All equipment shall be thoroughly cleaned before and aftereach use and before adding new material.

(d) An adequate moisture trap shall be installed between the airsupply and each pressure pot. The trap shall be of the typethat will continuously bleed off any water or oil from the airsupply.

(e) Suitable pressure regulators and gauges shall be provided forboth the air supply to the pressure pot and the air supply to thespray gun. Spray equipment and operating pressures shallcomply with therecommendations of the manufacturer.

(f) The length of hose between the pressure pot and spray gunshall not exceed 15 m.

4.3.2 Procedures

(a) Pressure pot, material hose and spray gun shall be kept at thesame elevation where possible. When spraying inorganic zinc,the elevation difference shall not exceed 3m.

(b) The spray gun shall be held at right angles to the surface.

(c) Each pass with the spray gun shall overlap the previous passby 50%.

(d) The spray width shall not exceed 300 mm.

(e) All runs and sags shall be immediately brushed out or thesurface
re-coated.

(f) Large surfaces shall receive two passes (except when applyinginorganic zinc) at right angles to each other (crosshatched).

4.3.3 Airless Spray Equipment

(a) Airless spray equipment may be used for applying inorganic zinc, epoxy oraliphatic polyurethane coatings.

(b) The manufacturer's recommendations in selection and use ofairless spray equipment shall be followed.

4.4 Brush Application

4.4.1 General Requirements

(a) Coating shall be applied by brush on all areas, which cannot beproperly spray coated such as corners, edges, and welds etc.,

(b) Inorganic zinc primer coatings shall not be applied by brushing,not even for touch – up repairs.

4.4.2 Equipment for Brush Application

Brushes shall be of a style and quality that will permit properapplication of coating. Round or oval brushes are most suitable forrivets, bolts, irregular surfaces and rough or pitted steel. Wide flatbrushes are suitable for large flat areas. Brush width shall not begreater than 100 mm. No extension handles shall be used on brushes.

4.4.3 Procedure for Brush Application

(a) Brushing shall be done so that a smooth coat, uniform inthickness, is obtained. There shall be no deep or detrimentalbrush marks.

(b) Paint shall be worked into all crevices and corners.

(c) All runs and sags shall be brushed out to prevent air pockets,solvent bubbles or voids.

(d) When applying solvent type, coatings, care shall be taken toprevent lifting of previous coats.

4.5 Safety Equipment

Appropriate safety equipment shall be provided for blasters, painters andother workers involved in the preparation and application of coating systemsas per recommendation of paint manufacturer. Work areas shall beadequately ventilated.

5.0 REPAIR OF DAMAGED AREAS

All areas of paintwork that are locally damaged during transportation,handling or erection shall be fully repaired to the satisfaction of the company.
Prior to the application of any coat, damage to previous coat(s) shall be touched-up by removing the damaged coatings, preparing the surface andreapplying the protective coat(s).

5.1 Repair Procedure for Damaged coating

Surfaces where coating is damaged after application of the finish coat shall berepaired as follows;

5.1.1 Top Coat

The top coat damaged, but base coat undamaged and the metal substrate is not exposed:

(a) Damaged coating shall be removed with a hand file and abraded back tothe sound coating using emery paper or a fine grinder.

(b) The damaged area shall be wiped with a suitable solvent to removedebris. The periphery of repair area shall be feathered back for a minimumdistance of 25 mm into the adjacent undamaged coating by light abrasion orgrinding to produce a smooth chamfered surface profile.

(c) Apply a new topcoat as specified.

5.1.2 Base Coat

Coating damaged to base metal

a) The damaged area greater than 0.2m^2 in area, the surface of exposed
metal shall be prepared to the original specified standard prior to repairing bypower tool cleaning as per SSPC-SP3 or spot blasting to SSPC-SP5 andapplying primer, intermediate coat and final coat as specified. Alternatively,high solid surface tolerant epoxy coating such may be used in place of primer &intermediate coats, followed by specified topcoat.

b) The damaged areas less than 0.2 m^2 in area may be repaired as per
manufacturer's recommendation or by preparing the surface of exposed metalby power tool cleaning as per SSPC-SP11 to the original specified standard.

A primer, intermediate and final coat shall be applied as specified. Alternatively,high solid surface tolerant epoxy coating such may be used in place of primer &intermediate coats, followed by specified topcoat. Brush application isacceptable. Even appearance and smooth feathering into surrounding coatingin addition to correct dry film thickness and holidays must be achieved. Coatingand surrounding repaired areas shall not be damaged and complete tie-in ofthe coating with surrounding areas shall be obtained. Zinc based productsshall not be applied without Blast Cleaning to Sa 2 ½, instead Surface tolerantepoxy such at 100 microns shall be used as a primer in case blast cleaning is notpossible or practical.

6.0 INSPECTION AND TESTING

6.1 Quality Control

Procedures for testing and documenting quality control shall be prepared prior to theinitial start up of any work covered by this specification & submitted to company forapproval. The procedures shall include methods to assure the specification requirements are met and forms to document environmental conditions, surface temperature, coating applicator, surface(s) being coated, coating applied and status of required examinations and tests.

Testing and inspection shall be carried out in accordance with Table-6.2. Surfaces shall be accessible until final inspection is carried out.

6.2 Inspection and testing requirement

Test type	Test Method	Test Frequency	Acceptance criteria	Consequence
Environmental conditions	Ambient and steel Temperature. Relative Humidity. Dew point.	Before start of each shift +minimum twice per Shift.	In accordance with Specified requirements	No blasting or coating
Visual examination	Visual for sharp edges	100 % of all surfaces	No defects, see Specified	Defects to be repaired

	weld spatter slivers, rust grade, etc.		requirements	
Cleanliness	a) ISO 8501-1 b) ISO 8502-3	a) 100 % visual of all surfaces b) Spot checks	a) In accordance with specified Requirements b) Maximum quantity and size rating 2	a) Reblasting b) Recleaning and retesting until acceptable
Salt test	ISO 8502-6 and ISO 8502-9	Spot checks	Maximum conductivity corresponding to 20 mg/m_2 NaCl	Repeated washing with potable water &retesting until acceptable
Chloride test	ISO 8502-2 ISO 8502-5	-	10microgram/sq.cm for external & 5 microgram/sq.cm fir internal vessel	-
Roughness	Comparator or stylus instrument (see ISO 8503)	Each component or once per 200 m_2	As specified	Reblasting
Curing test (for Zn silicate)	ASTM D4752	Each component or once per 100 m_2	Rating 4-5	Allow to cure
Visual examination of coating	Visual to determine curing,contamination, solvent retention, pinholes/popping, sagging & surface defects	100 % of surface after each coat	According to specified requirements	Repair of defects
Holiday detection	NACE RP0188 and as per *note -1 below	As per coating system specification	No holidays	Repair &retesting.
Film thickness	ISO 19840. Calibration on a smooth surface	ISO 19840	ISO 19840, and coating system data sheet	Repair,additional coats orrecoating as appropriate
Adhesion	ISO 4624 using equipment with an automatic centeredpulling force	Each component or once per 200 m2	*See note-2 below	Coating to be rejected

	& carried out when coating system are fully cured			

*Note:

1. Holiday Testing
   Holiday testing shall be conducted in accordance with NACE SP0188. Minimum 10% of the coated areas, which include weld seams, corners, and edges, shall beholiday detected. Any holiday is unacceptable and shall be marked and repaired according tospot repair procedures.
2. Adhesion test
   Adhesion test shall be carried out on separate test plates, minimum adhesion values inaccordance with ISO 4624 shall be 5,0 MPa when using automatically centered test equipment.

6.3 Qualification of supervisors, foremen and QC personnel at The FabricationYard

The contractor's quality control inspector shall be qualified as a coating inspectorin accordance with NS 476 Inspector level I or NACE level-I.

The contractor's quality control inspector shall qualify the tradesman level asblast-cleaner, painter, and applicator etc. for painting application.

The personnel shall have relevant knowledge of health and safety hazard, use ofprotection equipment, coating materials, mixing and thinning of coatings, coatingpot-life, surface requirements etc.

Contractor shall carry out tests in accordance with the company approvedCoating Procedure Specification for all coating systems thatare planned to be used for this project before commencement of painting work.
The test shall be supervised by the coating manufacturer's Authorized technicalrepresentative and the contractor's quality control inspector andshall be witnessed & inspected and accepted by the FQA of Adani. Contractor shallissue an inspection report covering the qualification tests for the companyapproval.

The test shall be carried out on a test panel (minimum 1 m x 1 m) and at least onone end of, angle, channel, beam and flat bar and analternative location providing similar complexity on the component to be used.

The acceptance criteria are the requirement to the visual and non – destructive
inspection of the coating system described in this specification.Operators failing to meet the requirement shall not be allowed to carry out thework on this project.

6.4 Equipment and Material

Materials, tools or equipment used in the surface preparation and coatingapplications, shall be inspected regularly and rejected if they do not comply with
the Specification.

6.5 Inspection Instruments

The following items shall be inspected using the inspection instruments listed below:

Instrument Item	Inspection Instrument
Surface Profile	Keane-tator Surface Profile Comparator or Testex Press-o-Film Elcometer 124 with 122 testex tape
Holidays	Tinker – Rasor Model M – 1
Surface Cleanliness	SSPC – Vis – 1
Viscosity	Zahn Viscometer or Ford Cup
Wet Film Thickness(WFT)	Nordson Wet Film Thickness Gauge Sheen WFT Gauge
Temperature & Humidity	Gardner Certified Hydrometer And Temperature Indicator
Surface Temperature	Pandux Surface Temperature Thermometer Elcometer Surface temperature gauge
Compressed Air Quality	Dry white cloth

6.5.1 Calibration

Each test instrument shall be maintained and calibrated as prescribed by themanufacturer.

6.5.2 Dry Film Thickness

The dry film thickness of the coating system shall be determined in accordancewith SSPC-PA2 or by a Micro test thickness gauge or comparable instrument in
accordance with the following procedure.

(a) Ten readings shall be taken for every 10$m^2$of painted areas.
(b) 90% of all readings shall be within the specified dry filmthickness.
(c) Where thickness accordance with the above procedure fallbelow the specified minimum an additional coat of theintermediate or finish coat shall be applied.

7.0 PAINT MATERIALS:

The coating manufacturer shall provide a Coating System Data Sheet (CSDS) foreach coating system to be used, containing at least the following information foreach product:

- Surface pre-treatment requirements;
- Dry Film thickness (maximum, minimum and specified);
- Maximum and minimum re-coating intervals at relevant temperatures;
- Information on thinners to be used (quantities and type);
- coating repair system.
- Practical consumption
- Expected life of product with guarantee.
- MSDS

Paint manufacturer shall furnish all the characteristics of paint materials onprinted literature, along with the test Certificate with actual test values ofsupplied batch for all the specified characteristics given in the specifications.

All the paint materials shall be of first quality, should pass all pre qualification testing for corrosive category – C5-M as per ISO 12944 and conform to the followinggeneral characteristics as per the tables below:

TABLE 7.1: REQUIRED CHARACTERISTIC OF PAINT MATERIALS

Technical Name	Type & Composition	Volume of solids (apprx.)	DFT (Dry Film thickness) per coat (apprx.)	Weight Per liter in kgs/ liters (approx)	Touch Dry at 25°C (approx	Hard dry at 25°C (approx.)	Over coating Interval (approx.)	Pot life (approx.) 25°C
Inorganic zinc silicate CoatingContaining	A two pack air drying self –	65 %±2	65-75 µ	2.2+/- 0.02	30 mts.	Over night	Min.; 16-24Hrs Max. Indefinite.	4 Hrs

minimum 85% ±2 zinc in dry film by weight & 96% Purity of Zinc.	curingsolvent basedInorganic Zinc silicatecoating.							
Epoxy MIO High build containing minimum 50% MIO in dry film.	Two pack, super high build, polyamide cured epoxy, pigmented with natural lamellar micaceousironoxide	Min. 80%± 2	125-150 µ	1.82+/- 0.02	3 Hrs.	Overnight	Min. : 18 Hrs. Max. : Indefinite	2 hrs.
Glossy Aliphatic acrylic Polyurethane Topcoat	Two Components High Build Aliphatic Acrylic Polyurethane.	min 62% ±2	50-75 µ	1.46 +/- 0.02	1.5 hrs	12 hrs	Min. ;12 hrs Max. ;As per suppliers data	3 Hr
Inorganic zinc silicate Coating Containing minimum 75% ±2 zinc in dry film by weight & 96% Purity of Zinc.	A two pack air drying self – curing solvent based Inorganic Zinc silicate coating.	Min 60%± 2	65-75 µ	2.0+/- 0.02	30 mts	Overnight	Min.; 16-24 Hrs Max. Indefinite.	4 Hrs
Epoxy MIO High build containing minimum 50% MIO in dry film.	Two pack, high build, polyamide cured epoxy, pigmented with lamellar MIO.	Min 60%± 2	100-125 µ	1.58+/- 0.02	4 Hrs	18 hrs	Min. : 18 Hrs. Max. : Indefinite	5 hrs
Epoxy Direct to Metal Primer cum Finish Coating	Two pack, rapid cure, high build epoxy DTM primer cum finish	Min 70%±2	75-150 µ	1.63 +/- 0.02	30 mts	60 mts	60 mts	2 hrs
Rapid cure epoxy high build zinc phosphate primer(16% ZP content)	Two pack, rapid cure, high build polyamide cure, epoxy zinc phosphate primer.	Min 63%±2	50-100 µ	1.51+/- 0.02	45 mts	3 hrs	3 hrs	6 hrs
Self -priming Surfacetolerant High build Epoxycoating	Two pack amid amine cured self priming epoxy mastic.	Min. 80%± 2	100-125u	1.46 +/- 0.02	5 Hrs.	24 Hrs	Min, :24 Hrs Max –As recommended by manufacturer	2 hrs

8.0 COATING SYSTEMS

8.1 Scope

The following section outlines the requirement of supply & application of anti corrosive coatings for corrosion protection of steel structural's

exposed to environments classified by ISO 12944-2 as C5-I,C5-M, C- 4 & C-3and to get long term life (High Durability – above 15 years)

8.2 Surface Preparation

All the parts to be sprayed shall be degreased according to SSPC-SP 1. The absence ofoil and grease after degreasing shall be tested by method given elsewhere in thespecification.

Grind all sharp edges and corners to a minimum radius of 2 mm. Remove all welding slag, spatter & blend grind all sharp welds & high spots. Remove all salt deposits by jetting with clean (potable) water. Thereafter the surface to be abrasive blasted to near white metal finish as perSSPC-SP 10. Using SSPC VIS 1, it is to bevisually assessed that the blast cleaned surface meets requirement of SSPC-SP 10.

Thereafter clear cellophane tape test as per ISO 8502-3shall be used to confirmabsence of dust on the blasted surface. Finally blasted surface shall be tested forpresence of soluble salts as per method ISO8502-9. Maximum allowable salt content shall be considered 50mg/M2. (5 micrograms/cm^2) In case salt content exceedsspecified limit .The contaminated surface shall be cleaned by method as per Annex –Cof ISO - 12944-4 (Water Cleaning.) or as per ISO 8501 – 4 (Wa-Wa 2 ½). After cleaning the surface shall be retested for saltcontent after drying.

The blasting media shall be either chilled iron or angular steel grit as per SSPC-AB-3of mesh size G-16 to G-40. Copper or Nickel slag or Garret as abrasive will also besuitable having mesh size in the range of G16 to G24, conforming to SSPC-AB-1.

Mesh size shall be required as appropriate to the anchor tooth depth profile requirementand blasting equipment used. The blasted surface should be having angular profiledepth of 50 to 75 microns with sharp angular shape. The profile depth shall bemeasured according to NACE standard RP 0287 (Replica Tape) or ASTM D 4417method B (Profile depth gauge).

Suitable enclosure shall be provided to carry out the blast cleaning operation. The contractor shall put up minimum three temporary sheds each of size 15m x 30m with handling facilities at site to carry out abrasive blasting. If required prior approval from the factory inspector/pollution

control board etc. shall be obtained regarding the method of blast cleaning and abrasives used therein.

For manual blasting one profile depth measurement shall be taken every 10-20 M^2 ofblasted surface.Surface preparation shall be completed in one abrasive blast cleaning operationwherever possible.If rust bloom(visual appearance of rust) appears on the blast cleaned surface beforepriming, the affected area shall be re-blasted to achieve specified degree ofcleanliness after which only application of inorganic zinc silicate.

Air blasting pressure at nozzle shall be normally maintained at 100 psi. Air pressureand media size should be reduced and adjusted to preclude damage/distortion to thingauge materials. Blasting time on work piece should be adjusted to only clean thesurface and cut required anchor tooth with minimum loss of metal. Blast angle shouldbe as close to perpendicular as possible but in no case greater than $\pm 30^0$ fromperpendicular to work surface. Blasting media must be free of debris, excessive fines, contaminants such as Nacl and sulfur salts (Ref. SEC 13.2.1.6 of this Spec).

F-Tests for blasting media, blasting air& surface contamination.

F-1- Blasting Media

(For every fresh batch of media and one random test during blasting)

a) Blasting Media shall be visually inspected for absence of contamination anddebris using 10 X magnification.

b) Inspection for the absence of oil contamination shall be conducted usingfollowing procedure:

- Fill a small clean 200 ml bottle half full of abrasive.
- Fill the bottle with potable water, cap and shake the bottle.
- Inspect water for oil film/slick. If present, the blasting media is not to be used.

c) Soluble salt contamination if suspected shall be verified by method ASTM D4940. If present, media to be replaced.

d) Clean blasting equipment, especially pot and hoses, thenreplace blasting media and retest.

F-2 Test for Blasting Air

(Once Daily before start of blasting & once at random duringblasting)

The air for blasting shall be free from moisture and oil. The compressor air shall bechecked for oil and water contamination per ASTM D 4285.

F-3-Test for presence of oil/grease and contamination

The steel substrate after degreasing as per SSPC-SP 1 shall be tested as per followingprocedure to validate absence of oil and grease contamination.

a) Visual inspection - Continue degreasing until all visible signs of contaminationare removed.

b) Conduct a solvent evaporation test by applying several drops or a small splash
Of residue- free trichloromethane on the suspect area especially pitting, crevice corrosionareas or depressed areas. An evaporation ring formation is indicative of oil and greasecontamination.Continue degreasing and inspection till test is passed.

8.3 Paint Systems

8.3.1 For C5-M Environment Classification

Primer Coat: 1 coat of inorganicethyl self curing zinc silicate primer (coating) at 75 microns DFT/Coat to be applied by airless/pressure pot for high durability >15 yrs. The primer should meet the requirements of SSPC-SP 20 performance standard. Minimum Metallic Zinc in the dry film by weight must be 85%. Volume solids of the primer must be 65% .

Intermediate coat – 1 coat of Super High build epoxy MIO coatingcured with polyamide hardener at 150 microns DFT/ Coat to be applied by airless spray. Minimum Natural Lamellar Micaceous Iron Oxide content in the dry film must be 50% by weight. Volume solids of the product must be 80% .

Finish Coat- Two coats of High Build Gloss Aliphatic Acrylic Polyurethane at 50micron/coat dry film thickness to be applied by brush/airless spray. Total thickness of the finish coat will be 100 microns. Volume Solids of the product must be 62% .

Total DFT minimum: 325 Microns and maximum: 350 Microns.

Notes:

1. This paint system is equivalent to the protective paint system no's (S7.14 & S 6.08) recommended for corrosion category C5-M & C5-I in ISO 12944-5.
2. This system is satisfactory for surface temperatures to 90° Ccontinuous dry temperature.
3. Colour for final coat shall be as per colour code.
4. All material shall be supplied in the manufacturers original cans, durably & legibly marked with the description of the contents. This shall include the batch number, date of manufacturing & the manufacturer's name.
5. All coating materials used shall confirm to the composition clauses given against each product in the specification. In meeting the composition clauses, the manufacturer shall provide evidence of compliance from approved third party lab before start of the job & internal test report along with every supplied batch.
6. Material containing cadmium, lead or any other toxic material to environment/personnel shall not be used.

8.3.2 For C-4 Environment Classification

Primer Coat: 1 coat of inorganic ethyl self curing zinc silicate primer (coating) at 75 microns DFT/Coat to be applied by airless/pressure pot. The primer should meet the requirements of IS - 14946 performance standard. Minimum Metallic Zinc in the dry film by weight must be 75%. Volume solids of the primer must be 60% .

Intermediate coat – 1 coat of High build epoxy MIO coating cured with polyamide hardener at 100 microns DFT/ Coat to be applied by airless spray. Minimum Natural Lamellar Micaceous Iron Oxide content in the dry film must be 50% by weight. Volume solids of the product must be 60% .

Finish Coat- One coat of High Build Gloss Aliphatic Acrylic Polyurethane at 50 micron/coat dry film thickness to be applied by brush/airless spray. Volume Solids of the product must be 62%.

Total DFT minimum: 225 Microns.

Notes:

1. This paint system is equivalent to the protective paint system no S4.30 recommended for corrosion category C-4- in ISO 12944-5.
2. This system is satisfactory for surface temperatures to 90° C continuous dry temperature.
3. Colour for final coat shall be as per colour code.
4. All material shall be supplied in the manufacturers original cans, durably & legibly marked with the description of the contents. This shall include the batch number, date of manufacturing & the manufacturer's name.
5. All coating materials used shall confirm to the composition clauses given against each product in the specification. In meeting the composition clauses, the manufacturer shall provide evidence of compliance from approved third party lab before start of the job & internal test report along with every supplied batch.
6. Material containing cadmium, lead or any other toxic material to environment/personnel shall not be used.

8.3.3 For C-3 Environment Classification

Covered Areas like TG Shed etc:

Primer cum Top Coat: Two coat of DTM – Direct to Metal epoxy primer cum finish with optimum loading of Zinc Silicate anti corrosive pigments at 75 microns DFT/Coat to be applied by airless/pressure pot. The total thickness of the system will be 225 microns. Volume solids of the DTM coating must be 70%.

Total DFT minimum: 225 Microns.

Uncovered Areas – Exposed to UV Rays:

Primer Coat: 2coat of Rapid Cure, High Build, Epoxy Polyamide Cure Zinc Silicate Primer with optimum loading of Zinc Silicateanticorrosive pigment at 175 microns DFT/Coat to be applied by airless/pressure pot.Minimum Zinc phosphate pigment in the dry film by weight must be 16%. Volume solids of the primer must be 63%.

Finish Coat- One coat of High Build Gloss Aliphatic Acrylic Polyurethane at 50 micron/coat dry film thickness to be applied by brush/airless spray. Volume Solids of the product must be 62% .

Total DFT minimum: 225 Microns.

Notes:

1. This paint system is equivalent to the protective paint system no S3.18 recommended for corrosion category C-3- in ISO 12944-5.
2. This system is satisfactory for surface temperatures to 90° C continuous dry temperature.
3. Colour for final coat shall be as per colour code.
4. All material shall be supplied in the manufacturers original cans, durably & legibly marked with the description of the contents. This shall include the batch number, date of manufacturing & the manufacturer's name.
5. All coating materials used shall confirm to the composition clauses given against each product in the specification. In meeting the composition clauses, the manufacturer shall provide evidence of compliance from approved third party lab before start of the job & internal test report along with every supplied batch.
6. Material containing cadmium, lead or any other toxic material to environment/personnel shall not be used.

9 COLOUR SCHEDULE

9.1 EQUIPMENT AND PIPING STANDARD COLOUR CODE FOR MECHANICAL

EQUIPMENT

S. No.	Description	Ground Colour
A	**CLOSED COOLING WATER SYSTEM**	
1	Closed cooling water pumps	Sea Green
2	Plate heat exchanger	Sea Green
3	Closed cycle cooling water pump	Sea Green
4	CCCW Expansion tank	Sea Green
5	CCCW chemical dosing tank	Sea Green

B	**WATER TREATMENT PLANT**	
1	River water & Raw water	
a	Raw water pump	Sea Green
b	Clarifier	Sea Green
c	- Raw / Fire water storage tank	Sea Green
d	DM plant supply pump	Sea Green
e	Filter air blower	Sea Green
f	Filter back wash pump	Sea Green
g	Lime slaking tank & agitator	Sea Green
h	Lime slurry transfer pump	Sea Green
I	Lime solution tank	Sea Green
j	Lime solution dosing pump	Sea Green
k	Alum solution tank	Sea Green
l	Alum solution metering pump	Sea Green
m	Polyelectrolyte solution tank	Sea Green
n	Polyelectrolyte solution metering pump	Sea Green
o	Sludge feed pump	Sea Green
p	Filter press	Sea Green
q	Service water tank for DM building	Sea Green
r	Service water tank for control annex	Sea Green
2	Demineralisation system	
a	Activated carbon filter	Sea Green
b	Cation exchanger	Sea Green
c	Anion exchanger	Sea Green
d	Degasser tower	Sea Green
e	Air blower for degasser tower	Sea Green
f	Strong base anion exchanger	Sea Green
g	Degassed water transfer pump	Sea Green
h	Strong base anion exchanger	Sea Green
I	Mixed bed polisher	Sea Green
j	Air blower for mixed bed polisher	Sea Green
k	DM Water Storage tank	Sea Green
l	DM water transfer pump	Sea Green
m	Acid unloading cum transfer pump	Dark Admiralty Grey
n	Bulk acid storage tank	Dark Admiralty Grey
o	Acid measuring tank for SAC	Dark Admiralty Grey
p	Acid measuring tank for MB	Dark Admiralty Grey
q	Regeneration water pump	Dark Admiralty Grey
r	Caustic Lye unloading cum transfer pump	Dark Violet
s	Bulk caustic storage tank	Dark Violet
t	Caustic regeneration tank & agitator	Dark Violet
u	Caustic solution filter	Dark Violet

S.No.	Description	Ground Colour
v	Caustic dilution tank for SBA/WBA	Dark Violet
w	Caustic dilution tank for MB	Dark Violet
x	Caustic pump for regeneration for WBA/SBA	Dark Violet
y	Waste water recirculation cum disposal pump	Sea Green
C	**CRANE & HOIST**	
1	Power house EOT crane	Canary Yellow
2	CW pump house EOT crane	Canary Yellow
D	**COMPRESSED AIR PLANT**	
1	Air compressor	Sky Blue

2	Compressed air dryer	Sky Blue
3	Air receiver	Sky Blue
E	**Chemical Dosing**	
1	Hydrazine preparation tank	Dark Admiralty Grey
2	Ammonia preparation tank	Dark Admiralty Grey
3	Hydrazine & ammonia dosing tank	Dark Admiralty Grey
4	Hydrazine & ammonia dosing pump	Dark Admiralty Grey
5	Phosphate preparation tank	Dark Admiralty Grey
6	Phosphate dosing tank	Dark Admiralty Grey
7	Phosphate dosing pump	Dark Admiralty Grey
8	- Sampling system	Dark Admiralty Grey
F	**FIRE PROTECTION SYSTEM**	
1	Diesel engine driven pump	Fire red
2	Fuel tank for diesel engine driven pump	Fire Red
3	Main hydrant pump (Electrical)	Fire Red
4	Jockey pump	Fire Red
5	Fire Water Storage tank	Fire Red
6	CO2 cylinder	Fire Red
G	**FUEL OIL SYSTEM**	
1	Fuel oil pumps skid	Light Brown
2	Fuel oil Storage tank	Light Brown
3	Fuel oil strainer	Light Brown
H	**ASH DISPOSAL SYSTEM**	
1	Ash transmitting vessel	Aluminium
I	**AIR CONDITIONING AND VENTILATION SYSTEM**	
1	Refrigerant compressor	Sky Blue
2	Chilled / condenser pumps	Sea Green
3	Condenser water pipe	Sea Green
4	Fans	Grey

9.2 STANDARD COLOUR CODE FOR ELECTRICAL EQUIPMENT

Sl. No.	Description	Colour	Colour No.
1	Transformers	Light grey	Shade 631 of IS : 5
2	Bus ducts	Light grey	Shade 631 of IS:5
3	Junction boxes.	Light grey	Shade 631 of IS:5
4	HT/LT Switchboards, Distribution boards, Control & Relay panels		
	a) Indoor	Siemens	RAL 7032
	b) Outdoor	Light grey	Shade 631 of IS:5
5	UPS Panel, charger panels	Siemens	RAL 7032
6	DG Alternator	Onan Green	-
7	NGR	Light grey	Shade 631 of IS : 5
8	Motor	Light grey	Shade 631 of IS : 5
9	Lighting fittings	As per manufacturer's	As per manufacturer's
10	Cable trays	Galvanized	

Note: 1. All panels that are to be erected at CCR floor shall be painted using RAL 7032 (exterior colour). All Electrical, C&I, Fire alarm or any other panel shall have this colour.

9.3 COLOUR CODING FOR IDENTIFICATION OF PIPELINES USED IN THERMAL POWER PLANTS

Sl.No	Medium	Ground Shade		Band Shade		Remarks
		Color	Color No. as per IS:5	Color	Color No. as per IS:5	
1	Water system					
a)	Untreated or raw / service	Sea green	217	White	-	White is not included in IS - 5-2007
b)	Treated/dematerialized	Sea green	217	Light orange	557	
c)	Condensate	Sea green	217	Light brown	410	
d)	Potable water	Sea green	217	French blue	166	
e)	RO water	Sea green	217	Light orange	557	
f)	Service & clarified water	Sea green	217	French blue	166	
2	Steam system					
a)	Auxiliary steam	Aluminium	-	Signal red	537	with aluminium
3	Air system					
a)	Instrument	Sky Blue	101	White	-	
b)	Service/Plant	Sky Blue	101	White	-	White not included in IS-5 - 2007
c)	Vacuum pipes	Sky Blue	101	Black	-	Black not included in
5	Gas system					
a)	Hydrogen	Canary yellow	309	Signal red	537	
b)	Chlorine	Canary yellow	309	Dark violet	796	
c)	Carbon dioxide	Canary yellow	309	Light grey	631	
e)	Oxygen	Canary yellow	309	White	218	White is not included in

Sl.No	Medium	Ground Shade		Band Shade		Remarks
		Color	Color No. as per IS:5	Color	Color No. as per IS:5	
6	Oils					
a)	LDO/HFO	Light brown	410	Brilliant green	221	
b)	Transformer oil	Light brown	410	Light orange	557	
7	Chemical feed					
a)	Acid piping (in water treatment plant)	Dark admiralty grey	632	Signal red	537	Hazard mark is given
b)	Alkali Piping (in water treatment plant)	Dark violet	796	Golden yellow	356	Hazard mark is given
8	Fire services	Fire red	536	-	-	
9	Effluent pipes	Black	-	-	-	

9.4 COLOUR CODE FOR STRUCTURAL STEEL

SL. NO	ITEAM/SERVICE	COLOR	COLOR No. as per IS:5
1	Gantry girder & monorail	Brilliant green	221
2	Gantry girder & monorail stopper	Signal red	537
3	Building structural steel columns brackets, beams bracings, roof truss, purloin, side grit, louvers, stringers	Dark admiralty grey	632
4	Pipe rack structure & trestle	Dark admiralty grey	632
5	Chequered plate (Plain Face)	Black	-
6	Grating	Black	-
7	Ladder	Dark admiralty grey	632
	Hand railing		
8	Hand rail	Signal red	537
9	Middle rail	Signal red	537
10	Toe Plate	Signal red	537
11	Vertical post	Black	-
12	Structural steel for Silo	Smoke grey	692

10 RECOMMENDED LIST OF PAINT MANUFACTURER

1.Asian Paints India Ltd
2. Shalimar Paints
3.Jotun
4. Akzonobel
5. Berger Paints
6. Good lass Nerolac Paints
7. Bombay Paints
8. Jenson & Nicholson

11 PROCEDURE OF APPROVAL OF NEW COATING MATERIAL

Following procedure recommended is to be followed for approvalmaterials Manufactured by new manufactures (indigenous andforeign):

1. Sample shall be selected by adani and the manufacturer should arrange testing of the coating materials as per the List of tests given in Para 5 below from one of the reputed Government Laboratories. Testing charge shall be borne by manufacturer.

2. Samples of coating materials should be submitted to the Govt.Laboratory in sealed containers with batch number and testcertificate on regular format of manufacturer's testinglaboratory.

3. All test panels should be prepared by the Govt. testing agencycoloredphotographs of test panels should be taken before and afterthe test and should be enclosed along with test report.

   Sample batch number and manufacturers test certificate should beenclosed along with the report. Test report must contain detail ofobservations and rating if any as per the testing code. SuggestedGovt. laboratories are:

   RRL, Hyderabad
   HBTI, Kanpur
   DMSRDE, Kanur
   IIT, Bombay
   BIS, Laboratories
   UDCT, Mumbai

4. Manufacturers should intimate the company, details of samplesubmitted for testing, name of Govt. testing agency, date. Contactpersonnel of the Govt. testing agency. At the end of the test themanufacturer should submit the test reports to the Company forapproval. The manufacturer(s) shall be qualified based on the resultsof these tests and the Company's decision in this regard - shall be Finaland binding on the manufacturer.

5. All tests required for evaluation of acceptance coating materials forstructural steel in thermal power plant shall be as per C5-M classification in ISO 12944 – 2 relevant ISO/ASTM standards.

Types of Environment

ISO 12944 classification	Typical Environments
C1 & C2	Rural areas, low pollution. Heated building/neutral atmosphere.
C3	Urban and industrial atmospheres. Moderate sulphur dioxide levels. Production areas with high humidity.
C4	Industrial and coastal. Chemical processing plants.
C5I	Industrial areas with high humidity and aggressive atmospheres.
C5M	Marine, offshore, estuaries, coastal areas with high salinity.

BTG & AUXILIARIES

adani	**OWNER** MAHAN ENERGEN LTD. (MEL)
TATA	**OWNER'S ENGINEER** TATA CONSULTING ENGINEERS LIMITED
BHEL	**BTG CONTRACTOR** BHEL

adani

Bhavesh Patel — Digitally signed by Bhavesh Patel Date: 2024.07.12 20:09:46 +05'30'

Reviewer

Anbu R — Digitally signed by Anbu R Date: 2024.07.12 23:10:52 +05'30'

Approver

Categories:

- ☑ Cat-I — Approved. Good for Manufacturing/Construction/Fabrication.
- ☐ Cat-I* — Approved with minor comments. No resubmission is required. To be incorporated in As-Built. Good for Manufacturing/ Construction/ Fabrication subject to incorporation of comments.
- ☐ Cat-II — Resubmission is required. Approved & Released for Manufacturing/ fabrication/ construction subjected to incorporation of comments.
- ☐ Cat-III — Not Approved. Revise & Resubmit for Approval
- ☐ Cat-IV — For Information & Records.
- ☐ Cat-IV* — Incorporate Comments & resubmit for Information & records.

Note: "Approval of this document does not absolve the Contractor/ Supplier/Fabricator from fulfilling Contractual obligations in any way"

PLANT	**BHEL, HEEP HARIDWAR.**
DOCUMENT TITLE	**PAINTING SCHEME FOR STEAM TURBINE, TURBOGENERATOR, CONDENSER AND AUXILIARY SYSTEMS**
OWNER DOC. NO.	**552H-E-BTG-TGA-DM-N-V-0018**
CONTRACTOR / SUPPLIER DOC. NO.	**10868-ENGG-N001A**
PACKAGE DISCIPLINE	**STEAM TURBINE & GENERATOR**
PREPARED BY	**PRATEEK AGARWAL, SATENDER KUMAR & ANURAG PANDEY**
REVIEWED BY	**DHRUV GARG**
APPROVED BY	**DHRUV GARG**

TATA CONSULTING ENGINEERS LIMITED
CONTRACTOR DOCUMENT REVIEW STATUS

- ☑ 1 — Approved, Further work can Proceed
- ☐ 1* — Approved with minor comments. No resubmission is required. To be incorporated in As-Built. Good for Manufacturing/Construction / Fabrication subject to incorporation of comments.
- ☐ 2 — Approved with comments. Work can proceed subject to incorportaion of comments
- ☐ 3 — Not Approved. Revise according to comments & resubmit
- ☐ 4 — Retained for Information
- ☐ 4* — Incorporate Comments & resubmit for Information & records

Approval conveyed herein neither relieves CONTRACTOR of his contractual obligations and his responsibilities for correctness of dimensions, materials of construction, weights, quantities, design details, assembly fits, system / performance requirements and conformity of supplies with National/ international statutory laws as may be applicable , nor does it limit the Employer's rights under the contract.

Reviewed by: RS/PMJ Date: 12-07-2024

Revision Control History

Sr. No.	Revision No.	Date	Reasons for Change
1	00	04.12.2023	First issue
2	01	22.01.2024	Document revised in line with customer Comments. Changes are marked with Rev01.
3	02	14.02.2024	Document revised in line with customer Comments. Changes are marked with Rev02.
4	03	26.02.2024	Document revised & Change is marked with Rev03.
5	04	06.06.2024	Document revised & Changes are marked with Rev04.
6	05	10.07.2024	Document revised & Changes are marked with Rev 05.

PAINTING SCHEME FOR STEAM TURBINES, GENERATOR, CONDENSOR & AUXILIARIES

Painting Scheme 1.

Paint (Coat)	Paint Type	No. of coat	Total DFT*
Primer Paint	: Epoxy base Zinc rich primer paint	1 Coat	75
Intermediate Paint	: High build epoxy MIO coating cured with polyamide hardener	1 Coat	100
Finish (Final) Paint	: Aliphatic Acrylic 2 Pack Polyurethane Finish paint	1 Coat	50
		Total DFT	225

Details of Color Scheme:
(**Legend: W**-at BHEL works; **V**- at vendor's works; **S**-at site; **N A -**Not applicable)

No	Assembly	Shade as per IS-5 or	Primer	Int. Paint	Final Paint	Touch -up	Remarks
a	Bearing pedestals with assembled parts (outer unmachined surfaces)	Light Blue RAL 5012	W	W	W	S	
b	Front walls & Side Walls of LPT. (Outer unmachined surfaces)	Light Blue RAL 5012	W	W	W	S	
c	Rupture Diaphragm Assembly	Light Blue RAL 9011	W	W	W	S	
d	Hydraulic Turning motor	Light Blue RAL 5012	V	V	V	S	
e	LP upper parts (outer unmachined)	Light Blue RAL 5012	W	W	W	S	
f	Suspension arrangement for LPBP & overload valves (unmachined)	Graphite Black RAL 9011	V	V	V	S	
g	Shaft Supports (IP & LP) & Casing Supports	Light grey ISC No. 631	W	W	W	S	
h	Assy fixture for HPT (unmachined)	Light Blue RAL 5012	W	W	W	S	
i	Turning over device (unmachined) for HPT	Light Blue RAL 5012	W	W	W	S	
j	Assy tools for main turbine (unmachined surfaces)	NA	W	W	W	S	TRP HE 1712 (Light Green/Light brown) (Rust preventive)

k	Assy device for valves & Support for valves	NA	W	W	W	S	Red oxide primer Grease TRP HE 1712 (Light Green/Light brown) (Rust preventive)
l	Support of Breech block (Valve support)	NA	W	W	W	S	TRP HE 1712 (Light Green/Light brown) (Rust preventive)
n	Mounting frame of bearing shell	Graphite Black RAL 9011	W	W	W	S	
o	Shaft Lifting device (LPT)	Light Blue RAL 5012	W	W	W	S	
p	Grating Coverings for LPT	NA	W	W	W	S	Red oxide primer Grease
q	Shaft seal lifting device & dev. Axial holding of LP shaft	Light Blue RAL 5012	W	W	W	S	
r	Stretching device for Breech Block & Breech Nut Heating Device	NA	V	V	V	S	
s	Hand barring gear	NA	W	W	W	S	TRP HE 1712 (Light Green/Light brown) (Rust preventive)

03

Note: Any type of Imported Item is transported in Sea worthy packing and painting is done as per C-4 Environment classification. Total DFT is of 225 Microns.

01

Following Items are not painted as these are of Stainless Steel

Compensators

PAINITNG SCHEME NO	TYPE OF PAINT	COMPONENTS
2.	Heat resistant Aluminum paint (IS 13183) No. of coats: -2, Total DFT- 40µm	1. Casing and covers of valves (outside) 2. HPT &IPT outer casing & IPT supporting arm for Push-Rod (Outer Unmachined) 3. HP & IP Stop & Control valve casings outer (Unmachined) 4. LP Shaft Seal Casings 5. Cross over pipe Assembly 6. Overload Valve & overload valve casing assembly. 7. Seal Steam Supply Valve 8. Leak-off Steam Valve

04

Note: Above components are exposed to steam from inside and are covered with insulation.

Surface Preparation:

1- It is necessary that the surface to be painted is free from loose dust, mill scale, rust, grease, oil, old film etc. Surface cleaning and preparation is to be done for all the components as per BHEL standard practice. The surfaces before painting should correspond to standard degree of purity SA 2.5.

2- Checking of surface preparation, / measurement of dry paint thickness, adhesion, gloss & finish of painted surface is done as per Adani's Technical Specification (Vol-II, Annexure-1) for Painting & Coating of Equipment & Structures (Clause 6.0, Inspection & Testing)

01

PAINTING SCHEME FOR
Condenser & Heat Exchangers (BHEL Hardwar)

Sl. No.	Paint (Coat) Paint Type	No. of coat	Total DFT
	Primer Paint : Epoxy base Zinc rich Primer Paint	1 Coats	75
	Intermediate Paint : High build epoxy MIO coating cured with polyamide hardener	1 Coat	100
	Finish (Final) Paint : Aliphatic Acrylic 2 Pack Polyurethane Finish paint	1 Coats	50
		Total DFT 225 microns min.	
	For Gland Steam Condenser:		
	Paint (Coat) Paint Type	**No. of coat**	**Total DFT**
	Primer Paint : Epoxy base Zinc rich Primer Paint	1 Coats	75
	Intermediate Paint : High build epoxy MIO coating cured with polyamide hardener	1 Coat	100
	Finish (Final) : Heat Resistant Aluminum paint	1 Coats	50
		Total DFT 225 microns min.	

A. **Details of Color Scheme (Outside Surfaces):**
(**Legend** : **W**-at BHEL works; **V**- at vendor's works; **S**-at site; **NA-**Not applicable)

01		Assembly	Shade as per IS-5 or Eq.	Primer	Int. Paint	Final Paint	Touch -up	Re-marks
		Condenser	RAL 7001-Silver Grey	W	W	S	S	
		LP Heater	-- Do --	W	W	W	S	
		Hydrogen Coolers & Exciter Air Coolers.	Grey RAL 9002	W	W	W	S	
		Gland Steam Condenser	-- Do – and Heat Resistant Aluminum paint	W	W	W	NA	
		Air Exhauster for Gland Steam Condenser	Grey RAL 9002	V	V	V	S	

Following Items are BOI.

1. Condenser Air Evacuation Equipment:
2. Turbine Oil Coolers (PHE Type):

Painting is done as per C-4 Environment classification. Total DFT is of 225 Microns

B.	**Details of Painting (Inside Surfaces):**							
01		**Assembly**	**Shade as per IS-5 or Eq.**	**Primer**	**Int. Paint**	**Final Paint**	**Touch-up**	**Remark**
		Condenser						
		# Cooling water side surfaces (water boxes inside)	**Black**	**W** (DFT 75 microns)	--	**W** (High Build Black Coal Tar Epoxide Paint, Total DFT 0.25mm	**NA**	
		# Tube plate surface towards water box side.	**-do-**	**S @**	--	**-do-**	**-do-**	After tubing.
		# Shell side inside surfaces (steam side)	Shell side inside surfaces are supplied coated with Steam Washable Paint at Works. This paint is to be washed before commissioning.					
02		LP Heater & Gland Steam Condenser	Shell side & Water box inside surfaces are supplied coated with Steam Washable Paint at Works. This paint is to be washed before commissioning.					

01

@ Tube plate surface is supplied painted with steam washable paint which is to be cleaned before applying Primer on water box side surface.

4033-0810

PAINTING SCHEME
FOR
TURBOGENERATOR AND AUXILIARY SYSTEMS

Sl No | **Details**

01 **The following are the details of painting scheme:**

Paint (Coat)	Paint Type	No. of coat	DFT*
Primer Paint	: Epoxy based Zinc rich primer paint	1 Coat	75
Intermediate Paint	: High build epoxy MIO coating cured with polyamide hardener	1 Coat	100
Finish (Final) Paint	: Aliphatic Acrylic 2 Pack Polyurethane Finish paint	1 Coat	50
		Total DFT	225

* DFT – Dry Film Thickness (final) in microns.

02 **Details of Color Scheme :**
(**Legend** : **W**-at BHEL works; **S**-at site; **V**-at vendor's works; **NA-** Not Applicable)

No	Assembly	Shade as per IS-5 or Eq.	Primer	Int. Paint	Final Paint	Touch-up	Identification Band Colour (For Piping)	Remarks
A	Turbogenerator (Stator, end-shields etc.)	Blue RAL 5012	W	W	W	S		R05
B	Exciter	NA	W	NA	NA	NA		
C	Exciter Cover	Blue RAL 5012	V	V	V	NA		R05
D	S.O. Unit	Grey RAL 9002	W	W	W	S		
E	S.O. Storage Tank	Grey RAL 9002	W	W	W	S		
F	Liquid Detector Rack	Grey RAL 9002	W	W	W	S		
G	S.O. Piping	Grey RAL 9002	W	S	S	NA	Light Brown ISC 410	Legend - SO
H	Gas Unit	Grey RAL 9002	W	W	W	S		
I	H2 Distributor	Grey RAL 9002	W	W	W	S		
J	CO2 Distributor	Grey RAL 9002	W	W	W	S		
K	N2 Distributor	Grey RAL 9002	W	W	W	S		
L	CO2 Vapouriser	Grey RAL 9002	W	W	W	S		
M	Refrigeration Gas Dryer	Grey RAL 9002	V	V	V	S		
N	H2 Piping	Grey RAL 9002	W	S	S	NA	Canary Yellow ISC 309	Legend - H
O	CO2 Piping	Grey RAL 9002	W	S	S	NA	Canary Yellow ISC 309	Legend – CO2
P	ACW Piping for H2 coolers	Grey RAL 9002	W	S	S	NA	Sea Green ISC 217	Legend - ACW

	Q	Bearing Vapour Exhauster	Grey RAL 9002	V	V	V	S		
	R	PW pump & filter unit	Grey RAL 9002	W	W	W	S		
	S	PW coolers	Grey RAL 9002	V	V	V	S		
	U	PW Piping & impulse piping	Grey RAL 9002	W	S	S	NA	Sea Green ISC 217	Legend - DMW
	V	PW tank	Grey RAL 9002	W	W	W	S		
	W	Hanger & Pipe supports	Black RAL 9011	W	S	S	NA		

R05

NOTE: 1) Erection of generator piping and hangers / supports mentioned at sl. No. G, N, O, P, U & W is done at site. Hence, painting of these items (Int. paint & Final paint) shall be done at site by erection agency and paint shall be supplied by BHEL Haridwar.

As discussed and agreed, the final coat and Intermediate coat of painting is in BHEL scope and same shall be applied by BHEL at site.

एनटीपीसी NTPC	**CORPORATE QUALITY ASSURANCE/ कॉरपोरेट गुणवत्ता आश्वासन** **SUB-VENDOR QUESTIONNAIRE/ सब-वेंडर प्रश्नावली**

i.	***Item/Scope of Sub-contracting*** **उप-संविदा(अनुबंध) का मद/ दायरा**			
ii.	***Address of the registered office*** पंजीकृत कार्यालय का पता		***Details of Contact Person*** संपर्क व्यक्ति का विवरण ***(Name, Designation, Mobile, Email)*** (नाम, पदनाम, मोबाइल, ईमेल)	
iii.	***Name and Address of the proposed Sub-vendor's works where item is being manufactured*** प्रस्तावित उ□-विक्रेता □ □ार्यों □ ा नाम और □ता, जहां मद का निर्माण किया जा रहा है		***Details of Contact Person:*** संपर्क व्यक्ति का विवरण ***(Name, Designation, Mobile, Email)*** (नाम, पदनाम, मोबाइल, ईमेल)	
iv.	***Annual Production Capacity for proposed item/scope of sub-contracting*** **उप-संविदा(अनुबंध)** के प्रस्तावित मद / दायरे के लिए वार्षिक उत्पादन क्षमता			
v.	***Annual production for last 3 years for proposed item/scope of sub-contracting*** **उप-संविदा(अनुबंध)** के प्रस्तावित मद / दायरे के लिए पिछले 3 वर्षों का वार्षिक उत्पादन			
vi.	***Details of proposed works*** **प्रस्तावित कार्यों का विवरण**			
1.	***Year of establishment of present works*** वर्तमान फैक्टरी की स्थापना का वर्ष			
2.	***Year of commencement of manufacturing at above works*** उपरोक्त फैक्टरी में निर्माण कार्य शुरू होन का वर्ष			
3.	***Details of change in Works address in past (if any*** पूर्व में फैक्टरी स्थल में परिवर्तन का विवरण (यदि कोई हो))			
4.	***Total Area*** कुल क्षेत्र			
	Covered Area शामिल क्षेत्र			
5.	***Factory Registration Certificate*** फैक्टरी पंजीकरण प्रमाण पत्र		***Details attached at Annexure – F2.1*** विवरण अनुलग्नक- एफ 2.1 पर संलग्न है	
6.	***Design/ Research & development set-up*** डिजाइन / अनुसंधान और विकास सेटअप ***(No. of manpower, their qualification, machines & tools employed etc.)*** (श्रमिकों की संख्या, उनकी योग्यता, मशीन और उपलब्ध उपकरण □ दि)		***Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design)*** ***Details attached at Annexure – F2.2*** ***(if applicable)*** लागू / लागू नहीं, अगर विनिर्माण मुख्य संविदाकार / खरीददार के डिजाइन के अनुसार है) विवरण अनुलग्नक –एफ 2.2 पर संलग्न है ।	

		(यदि लागू हो)
7.	***Overall organization Chart with Manpower Details (Design/Manufacturing/Quality etc)*** मैनपावर विवरण के साथ समग्र सं□ ठन का चार्ट(डिजाइन / विनिर्माण / □ुणवत्ता आदि)	***Details attached at Annexure – F2.3*** विवरण अनुलग्नक – F2.3 में संलग्न है ।
8.	***After sales service set up in India, in case of foreign sub-vendor(Location, Contact Person, Contact details etc.)*** भारत में बिक्री सेवा की स्थापना के बाद, विदेशी उप-विक्रेता के मामले में(स्थल , संपर्क व्यक्ति, संपर्क विवरण आदि)	***Applicable / Not applicable*** ला□ू / ला□ू नहीं ***Details attached at Annexure – F2.4*** विवरण अनुलग्नक -2.4 पर संलग्न है ।
9.	***Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any*** फ्लोचार्ट सहित विनिर्माण प्रक्रिया निष्पादन योजना , जिसमें आउटसोर्स प्रक्रिया, यदि कोई हो, सहित कच्चे माल से तैयार उत्पाद तक विनिर्माण के विभिन्न चरणों को दर्शाया □ या हो,	***Details attached at Annexure – F2.5*** विवरण अनुलग्नक - F2.5में संलग्न है ।
10.	***Sources of Raw Material/Major Bought Out Item*** कच्चे माल के स्रोत / खरीदे हुए मुख्य मद	***Details attached at Annexure – F2.6*** विवरण अनुलग्नक - F2.6में संलग्न है।
11.	***Quality Control exercised during receipt of raw material/BOI, in-process , Final Testing, packing*** कच्चे माल / खरीदे हुए मद, प्रक्रियाबद्ध, अंतिम परीक्षण, पैकिं□ करते समय □ुणवत्ता नियंत्रण	***Details attached at Annexure – F2.7*** विवरण अनुलग्नक - F2.7 पर संलग्न है
12.	***Manufacturing facilities (List of machines, special process facilities, material handling etc.)*** विनिर्माण सुविधा(मशीनों की सूची , विशेष प्रक्रिया सुविधाएं, सामग्री रख-रखाव आदि)	***Details attached at Annexure – F2.8*** विवरण अनुलग्नक - F2.8में संलग्न है ।
13.	***Testing facilities (List of testing equipment)*** परीक्षण सुविधाएं(परीक्षण उपकरण की सूची)	***Details attached at Annexure – F2.9*** विवरण अनुलग्नक – F2. 9 में संलग्न है ।
14.	***If manufacturing process involves fabrication then-*** यदि निर्माण प्रक्रिया में फेब्रिकेशन की □ ई है तो-	***Applicable / Not applicable*** ला□ू / ला□ू नहीं ***Details attached at Annexure – F2.10*** विवरण अनुलग्नक - F2.10में संलग्न है। ***(if applicable)*** ला□ू / ला□ू नहीं
	List of qualified Welders पात्र वेल्डर की सूची	
	List of qualified NDT personnel with area of specialization विशेषज्ञता के क्षेत्र सहित पात्र एनडीटी कार्मिकों की सूची	
15.	***List of out-sourced manufacturing processes with Sub-Vendors' names & addresses*** सब-वेंडर द्वारा बाह्य स्रोतों (उनके नाम और पते सहित)से करवाएं □ ए निर्माण प्रक्रियाओं की सूची	***Applicable / Not applicable*** ला□ू / ला□ू नहीं ***Details attached at Annexure. –F2.11*** विवरण अनुलग्नक - F2.10में संलग्न है।

		(if applicable) (यदि लागू हो)
16.	***Supply reference list including recent supplies*** नवीनतम आपूर्ति सहित आपूर्ति संदर्भ सूची	***Details attached at Annexure – F2.12*** विवरण अनुलग्नक - F2.12 में संलग्न है । ***(as per format given below)*** (नीचा दिए गए प्रारूप का अनुसार)

Project/ package परियोजना /पैकेज	*Customer Name* ग्राहक का नाम	*Supplied Item (Type/Rating/Model /Capacity/Size etc)* आपूर्ति की गई वस्तु (प्रकार / रेटिंग / मॉडल / क्षमता / आकार आदि)	*PO ref no/date* पीओ संदर्भ सं. / तिथि	*Supplied Quantity* आपूर्ति की मात्रा	*Date of Supply* आपूर्ति की तारीख

17.	***Product satisfactory performance feedback letter/certificates/End User Feedback*** उत्पाद का संतोषजनक प्रदर्शन संबंधी फीडबैक पत्र / प्रमाण पत्र / अंतिम उपयोगकर्ता फ़ीडबैक	***Attached at annexure - F2.13*** अनुलग्नक F2. 3पर संलग्न है
18.	***Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product (similar or higher rating)*** प्रस्तावित उत्पाद (एक समान या उच्च रेटिंग वाले) के लिए टाइप टेस्ट रिपोर्ट (टाइप टेस्ट विवरण, रिपोर्ट संख्या, एजेंसी, जांच की तारीख) का सारांश नोट: - रिपोर्ट प्रस्तुत करने की आवश्यकता नहीं है ***Note:- Reports need not to be submitted***	***Applicable / Not applicable*** लागू / लागू नहीं ***Details attached at Annexure – F2.14*** विवरण अनुलग्नक - F2.1 4में संलग्न है ***(if applicable)*** (यदि लागू हो)
19.	***Statutory / mandatory certification for the proposed product*** प्रस्तावित उत्पाद के लिए वैधानिक / अनिवार्य प्रमाणीकरण	***Applicable / Not applicable*** लागू / लागू नहीं ***Details attached at Annexure – F2.15*** ***(if applicable)*** (यदि लागू हो)
20.	***Copy of ISO 9001 certificate*** आईएसओ 9001 प्रमाण पत्र की प्रति ***(if available***(यदि उपलब्ध हो)	***Attached at Annexure – F2.16*** अनुलग्नक में संलग्न - F2.1 6 है
21.	***Product technical catalogues for proposed item (if available)*** प्रस्तावित मद के लिए उत्पाद तकनीकी कैटलॉग (यदि उपलब्ध हो)	***Details attached at Annexure – F2.17*** विवरण अनुलग्नक - F2.1 7 में संलग्न है

Name: ***नामः***		***Desig:*** ***पदः***		***Sign:*** ***हस्ता क्षरः***		***Date:*** ***तिथिः***	

Company's Seal/Stamp:- ***कंपनी की मुहर / मोहरः -***

Bharat Heavy Electricals Limited
(A Govt. of India Undertaking)
HEEP, Ranipur Haridwar
MAIN CONTRACTOR's PROPOSAL

1.	Name of proposed vendor and factory location	
2.	Item details for which vendor approval is requested • **Item/Equipment** • **Size** • **Capacity** • **Rating** • **Service (Steam/Water/Other)** • **Plant System (Application)**	1. **Item/Equipment**: Specify the exact item or equipment name. 2. **Size**: Provide the dimensions or size specifications. 3. **Capacity**: Mention the capacity, such as volume, weight, or power. 4. **Rating**: Include any relevant ratings, such as voltage, pressure/temp class, or efficiency. 5. **Service**: Indicate the type of service (e.g., Steam, Water, Other). 6. **Plant System (Application)**: Describe the plant system or application where the item will be used.
3.	**Approval Status**: Whether approved by NTPC for project supply? (No/Yes) If **Yes**, provide the following details: • **Name of Project**: • **Plant Capacity**: • **Max Size/Rating of Item/Equipment Delivered**: • **Commissioning Date**: • **Operational Since**: • **Whether Supplied Through BHEL**:	
5.	Project supply experience for clients other than NTPC • **Name of Project**: • **Plant Capacity**: • **Max Size/Rating of Item/Equipment Delivered**: • **Commissioning Date**: • **Operational Since**: • **Whether Supplied Through BHEL**:	
6.	Reason for additional vendor proposal	
7.	Additional information if any	

Signature:
Name:

Main Contractor (name and Signature)

MAIN SUPPLIER'S EVALUTION REPORT
OF THE PROPOSED SUB-SUPPLIER

1. Name of Main Supplier :

2. Project Name :

3. Package Name :

4. Name of item/equipment to be procure :
(with Rating/Type/Size)

5. .Brief specification of equipment to be procured :

6. Name of the proposed sub-supplier :

7. Address of sub-supplier's Regd. office :
(with phone no. Fax no. & Email)

8. Address of the sub-supplier's manufacturing unit :
(with phone no. Fax no., & Email)

9. Name of the contact person of the sub- supplier :
(with phone no. Fax no., Mob no. & Email)

10. Reference List :
(Extensive experience in particular type of equipment to be procured)

Name of customer with address	Name of the plant where equipment were installed	Type/ Rating/ Capacity	Date of dispatch of equipment	Date of Commissioning of equipment	Nos. of years in operation	Performance feed back from customer

11. Main supplier's to submit their own assessment report of the sub-supplier:
Attached / Not attached

12. Main supplier's recommendation:

Name Designation Signature Date
Dept. / Company

List of enclosures :-
1.
2.
3.

adani	**ASSESSMENT OF SUPPLIER**

Name of item/equipments for which assessment is required:----------

1.0 GENERAL INFORMATION :-

1.1) Name of the company	
1.2) Address of their Regd. office with telephone No., Fax No.& E-Mail	
1.3) Address of the Supplier's factory / works with telephone No., Fax No.& E-Mail a) Weekly off :- b) Shift working per day:-	 a) ---------- b)One/Two/Three
1.4) Address of the Supplier's Branch offices with telephone No., Fax No.& E-Mail	
1.5) Nature of the firm: (Govt. Undertaking / State Govt. Undertaking / Private Company /Co-operative society / Partnership Firm / Proprietorship / Any other)	
1.6) Nature of Business (Manufacturing Unit / Agent / Distributor / Stockiest)	
1.7) Year of establishment	
1.8) Year of commencement of manufacturing	
1.9) Name of the Chief Executive/ Proprietor & Plant Manager	

1.10) Contact Person	

(Name, Designation, Address, Telephone no. , Mob. No. Fax & Email)	
1.11) Total Nos. of employees (Attach organization chart)	i) Administration & Commercial ----- ii) Engineering & Technology --------- iii) Manufacturing ---------- iv) Quality ---------- v) Maintenance ---------- vi) Site Management ---------- vii) Other ---------- viii) Total ----------
1.12) Total area of the Factory a) Covered b) Uncovered	
1.13) Electrical Power and alternative arrangement for power: (Give Details)	

2.0 FINANCIAL INFORMATION:-

	Year 1	Year 2	Year 3
2.1) Share Equity Capital			
2.2) Long Term Debt			
2.3) Investment in :- i)Land & building ii)Plant & Equipment iii) Other Fixed Assets			
2.4) Net Current Assets			
2.5) Net Current Liabilities			
2.6) Sales			
2.7) Profit before tax			
NOTE:- Copies of annual Balance Sheet for the last three years along with audit report to be submitted.			

3.0: <u>TECHNICAL INFORMATION</u> :-

adani	**ASSESSMENT OF SUPPLIER**

3.1 Manufacturing Capacity for the item / equipment for which approval is required

Sl. No	Name of Product	Licensed Capacity	Installed Capacity

3.2 Brief details of the item / equipment manufactured in the past three years:-

Sl. No.	Item Description	Specn/Grade/Size	Annual Production in the last three Years		

3.3 Manufacturing facilities including material handling facilities:-

Sl. No.	Description of machines used for manufacturing	Capacity, Size	Make	Yr of installation	Limitations	Remarks

3.4 Measuring, inspection, testing and heat treatment facilities (in house):-

Sl.No.	Description of equipment	Size, range, Capacity & accuracy	Make	Last date of calibration

3.5 Measuring, inspection, testing and heat treatment facilities (out sourced):

Sl. No.	Description of test	Name of the agency carrying out the test

3.6 Foreign collaboration, if any:

adani	**ASSESSMENT OF SUPPLIER**

Product	Name & address of the Collaborator	Year of Collaboration	Whether current or not

3.7 Details same/ similar item supplied in the last three years:-

Item description	Specn.& size	Major Customer Name	Project Name	Po. No. & date	Qty	Year of Supply	Remark

3.8 Source of raw materials:-

Description of raw materials	Name & address of the suppliers

3,9 Copies of Qualification Approval / Type Test certificates / Test Reports for the item / equipment witnessed by any independent agency may be attached.

3.10 Furnish process flow chart including inspection stages

3.11Details and experience of technical personnel (Head of various departments)

3.12Performance feed back if any – Attach feed back certificates.

4.0 <u>QUALITY MANAGEMENT SYSTEM</u>:-

4.1 Furnish organization chart of Quality department including NDT (non destructive test) personnel

4.2 Whether QA system is certified as per ISO- 9001? If yes then attach a copy of the certificate.

4.3 Incoming material control:-

A formalized supplier rating, evaluation & certification programme which includes quality performance criteria.	i)Whether such procedure exist? ii) Whether system is effective? iii)Whether records are available?	Yes/No Yes/No Yes/No
Verification of incoming material prior to storage	i)Whether such procedure exist? ii) Whether system is effective? iii)Whether records are available?	Yes/No Yes/No Yes/No

4.4 Process control:-

Work instructions have been documented by the sub supplier and followed by the worker.	i)Whether such procedure exist? ii) Whether system is effective? iii)Whether records are available?	Yes/No Yes/No Yes/No
Required tools, jigs & fixtures are identified and used.	i)Whether such procedure exist? ii) Whether system is effective? iii)Whether records are available?	Yes/No Yes/No Yes/No
Procedure for qualification & revalidation of qualification of welder and NDT operator or any other special processes	i)Whether such procedure exist? ii) Whether system is effective? iii)Whether records are available?	Yes/No Yes/No Yes/No
Testing facilities for Chemical, Mechanical, Electrical and NDT tests. Trained personnel carry out the tests and records are maintained.	i)Whether such procedure exist? ii) Whether system is effective? iii) Whether records are available? iv) Whether details of trained personnel submitted?	Yes/No Yes/No Yes/No Yes/ No
Preventative maintenance activities are performed critical machines and records maintained.	i)Whether such procedure exist? ii) Whether system is effective? iii)Whether records are available?	Yes/No Yes/No Yes/No
Material identification and acceptance status is maintained throughout the manufacturing process and storage.	i)Whether such procedure exist? ii) Whether system is effective? iii)Whether records are available?	Yes/No Yes/No Yes/No
Identification / Preservation, & Packing procedures	i)Whether such procedure exist? ii) Whether system is effective? iii)Whether records are available?	Yes/No Yes/No Yes/No

4.5 Control of non-conformance:-

Record of rework /rectification	i)Whether such procedure exist? ii) Whether system is effective? iii)Whether records are available?	Yes/No Yes/No Yes/No
System of review and analysis of repeated non-conformities/ failures and their prevention in future.	i)Whether such procedure exist? ii) Whether system is effective? iii)Whether records are available?	Yes/No Yes/No Yes/No

4.6 Calibration of measuring & testing equipments:-

System of calibration of gauges, fixtures and instruments	i) Whether such procedure exist? ii) Whether system is effective? iii)Whether records are available?	Yes/No Yes/No Yes/No
Master gauges / standards are traceable to recognized national standards.	i) Whether such procedure exist? ii) Whether system is effective? iii)Whether records are available?	Yes/No Yes/No Yes/No

4.7 Inspection & testing of finish product:-

System of inspection and testing of finished product exits.	i)Whether such procedure exists? ii) Whether system is effective? iii)Whether records are available?	Yes/No Yes/No Yes/No

4.8 System of recording, attending and monitoring customer complaint & corrective action.

System of recording, attending and monitoring customer complaint and corrective action exits.	i) Whether such procedure exist? ii) Whether system is effective? iii)Whether records are available?	Yes/No Yes/No Yes/No

4.9 Any other information:-

Enclosures:-

Place: Signature

Date: Name and Designation

Seal

[redacted]

ONE SIDED

NON DISCLOSURE AGREEMENT

THIS NON DISCLOSURE AGREEMENT (this "**Agreement**") entered into on this …….. day of June, 20.. (the "**Effective Date**")

By and Between

Bharat Heavy Electricals Limited (a Public Sector Undertaking of Government of India), a company incorporated under the Companies Act, 1956 and having its registered office at having its registered office at "BHEL House", Siri Fort, New Delhi - 110 049, India (hereinafter referred to as "**BHEL**" of which the expression shall unless repugnant to the context or the meaning thereof be deemed to include its successors and permitted assigns) (hereinafter referred to as "BHEL"),

And

ABC, a Company incorporated under the laws of …….. and having its registered office at …….. (hereinafter referred to as "ABC").

The party who is receiving information would be referred as Receiving Party and the party who is disclosing information would be referred as Disclosing Party, as the context requires.

WHEREAS

(A) The Disclosing Party and The Receiving Party wish to explore and discuss the potential of certain mutually advantageous business relationships for _____ , for the purpose of ……products in India ('the Purpose');

(B) The Disclosing Party, in furtherance of such business relationship, will disclose certain information, including but not limited to, scientific, development, financial, marketing, sales or other proprietary information;

(C) The Receiving Party and the Disclosing Party wish to protect and preserve the confidentiality of such information provided by the Disclosing Party to the Receiving Party by preventing its unauthorized disclosure and use, in accordance with the terms of this Agreement; and

(D) The Receiving Party agrees to hold such information in strict confidence and not to disclose or to use, directly or indirectly, for any purpose other than the performance of this Agreement

NOW, THERFORE and in consideration of the promises made herein, their mutual and individual interests, and other good and valuable consideration, the receipt and sufficiency of all of which is hereby acknowledged, the Parties agree as follows:

1. **PURPOSE**: Purpose to ne mentioned here.

2. **DISCLOSING PARTY**. means a Party that discloses the confidential information to the other party under this agreement.

3. **RECEIVING PARTY** means a Party that receives the confidential information from the other party under this agreement.

4. **Confidential Information**

(a) Subject to the provisions of this Agreement, all information disclosed by the Disclosing Party to the Receiving Party, shall be deemed to be "Confidential Information" for the purposes of this Agreement.

(b) (i) It is clarified that Confidential Information shall include, but is not limited to, any trade secret, technique, strategy, component, concept, program, report, study, memorandum, correspondence, documentation, information, manual, record, data, technology, product, plan, design, procedure, method, invention, sample, notes, summaries, analyses, compilations and other writings, producing any such sample, medium, test data relating to any research project, work in progress, future development, engineering, manufacturing, marketing, pricing, billing, servicing, financing, personnel matter, its present or future products, sales, suppliers, clients, customers, employees, investors, or any other information which the Disclosing Party provides to the Receiving Party whether in oral, written, graphic or electronic form and whether or not such information is identified as such by an appropriate stamp or marking. The Confidential Information shall also include all reports, notes or other material prepared by the Receiving Party based on the Confidential Information and/ or any discussion thereon.

(ii) Confidential Information includes information disclosed by the Disclosing Party or by any individual, firm or corporation controlled by, controlling, or under the common control of the Disclosing Party.

(c) Confidential Information shall not include any information which the Receiving Party can demonstrate to the Disclosing Party:

(1) is now, or has become, through no act or failure to act on the part of the Receiving Party, generally known or available to the public;

(2) is known by the Receiving Party at the time of receiving such information as evidenced by its records;

(3) is discovered/independently developed by the Receiving Party independent of any disclosures by the Disclosing Party; or

(4) is hereafter furnished to the Receiving Party by a third party, as a matter of right and without restriction on disclosure.

(d) Notwithstanding any other provision of this Agreement, the Receiving Party shall be permitted to disclose Confidential Information if such disclosure is in response to a valid order of a court or other governmental body, provided, however, that the Receiving Party shall be required to give prior notice in writing to the Disclosing Party so that the Disclosing Party may seek an appropriate protective order including that the Confidential Information so disclosed be used only for the purposes for which the order was issued;

5. <u>Disclosure</u>

In consideration of the disclosure of Confidential Information by, the Recipient hereby agrees to:

(a) Shall treat as confidential and safeguard all information disclosed and/or its Affiliates in connection

(b) to hold the Confidential Information in strict confidence and to take all necessary precautions to protect such Confidential Information (including, without limitation, all precautions the Recipient employs with respect to its own confidential materials);

(c) limit disclosure of any Confidential Information to its concerned directors, officers and employees, (collectively "Representatives") strictly only to who have a need to know such Confidential Information in connection with the Transaction between the parties to which this Agreement relates, and only for that purpose;

(d) advise its Representatives of the proprietary nature of the Confidential Information and of the obligations set forth 2 in this Agreement and require in writing such Representatives to keep the Confidential Information confidential;

(e) shall keep all Confidential Information strictly confidential by using a reasonable degree of care, but not less than the degree of care used by it in safeguarding its own confidential information;

(f) not disclose any Confidential Information received by it to any third party; and

(g) not to copy or reverse engineer any such Confidential Information.

(h) not to use the Confidential Information for any purpose other than the Transaction.

(i) not use the information for any scientific research or any other research.

(j) Confidential information does not include information:

a. Which is generally available to the public other than as a result of a breach of this Agreement; or

b. Which is already in the possession of Recipient without restriction prior to any disclosure hereunder: or

c. Which is or has been lawfully disclosed to Recipient by someone who is free lawfully to disclose the same without confidentiality restrictions: or

d. Which is independently developed by Recipient or its Affiliates and no Confidential information disclosed hereunder has been used directly or indirectly in such development; or

e. Whose applicable period of confidentiality pursuant hereto, or such other period specifically agreed to in writing by the parties, has ended

(k) This agreement is not intended to, and does not, oblige either party to enter into any further agreements or to proceed with the transaction, any possible relationship or other transaction. Recipient acknowledges that Discloser makes no representation or warranty whether express or implied, as to the accuracy or completeness of Confidential information, and Discloser disclaims any and all liability unless contained in any definitive agreement.

Each Party will comply with all applicable data protection laws and regulations. Where applicable in particular if one Party receives access to and processes personal data on behalf of the other party in connection with this Agreement and such processing agreement, the Parties will enter into any required data processing of other data protection agreement

6. <u>Restriction on Use</u>

(a) The Receiving Party and its Representatives shall hold the Confidential Information received from the Disclosing Party in confidence, and shall not, directly or indirectly:

(i) disclose the Confidential Information to any third party; or

(ii) use the Confidential Information for any purpose other than the permitted Purpose.

(b) The Receiving Party shall not use the Confidential Information for any purpose or in any manner, which would constitute a violation of any applicable laws or regulations, directly or indirectly.

(c) The Confidential Information shall be the property of the Disclosing Party. No rights, licenses or interests including, but not limited to, trademarks, inventions, copyrights or patents are implied, transferred or granted in relation to the Confidential Information provided by the Disclosing Party to the Receiving Party under this Agreement.

(d) The Receiving Party shall not reproduce the Confidential Information in any form except as needed for the Purpose of the Agreement as set out above or with the prior written consent of the Disclosing Party.

(e) All the title and rights in the Confidential Information shall be reserved with the respective Discloser and/or its licensors and no rights or obligations other than those expressly set out in this Agreement are granted or to be implied from this Agreement. In particular no license is granted to the Recipient, directly or indirectly, by this Agreement relating to any invention, discovery, patent, copyright or other industrial or intellectual property right now or in the future.

7. Protection of Confidential Information

(a) The Receiving Party represents and warrants that it shall protect the Confidential Information received with utmost care and diligence.

(b) All Confidential Information shall be promptly returned to the Disclosing Party after the Receiving Party's need for it has expired, or upon request of the Disclosing Party, and in any event, upon completion or termination of this Agreement.

8. No Further Warranties

The Confidential Information shall be disclosed on an "**as is**" basis only and without any warranties of any kind, including but not limited to, warranties of merchantability or fitness for a particular purpose.

9. No Further Business Arrangement

Nothing contained herein shall be construed to obligate either Party to enter into any further agreements with each other. This Agreement does not create any other business arrangement, including but not limited to any partnership, agency or joint venture, between the Parties.

10. Term

The term of this Agreement shall commence on the Effective Date and valid for the period of two (2) years. The Disclosing party shall have a right to terminate this Agreement by giving a written notice of 30 days to the Receiving Party. However, the Receiving Party obligation to protect and restrict the use of Confidential Information under this Agreement shall continue until such time as the Disclosing Party discloses it to the public or when it otherwise becomes part of the public domain through no action of the Receiving Party.

11. Injunctive remedy

The Recipient acknowledges that the Confidential Information to be disclosed hereunder is commercially sensitive of a unique and valuable character, and that the unauthorized dissemination of the Confidential Information would destroy or diminish the value of such information. The damages that would result from the unauthorized dissemination of the

Confidential Information would be impossible to calculate. Therefore, Recipient hereby agrees that the affected Discloser shall be entitled to injunctive relief preventing the dissemination of any Confidential Information in violation of the terms hereof. Such injunctive relief shall be in addition to any other remedies available hereunder, whether at law or in equity. The affected Discloser shall be entitled to recover all its damages, costs and fees, including reasonable attorneys' fees, incurred in obtaining any such relief. Further, in the event of litigation relating to this Agreement, the prevailing party shall be entitled to recover its reasonable attorney's fees and expenses.

12. Return of Confidential Information

Recipient shall immediately return and redeliver to the respective Discloser all tangible material embodying the Confidential Information provided hereunder and all notes, summaries, memoranda, drawings, manuals, records, excerpts or derivative information deriving there from and all other documents or materials ("Notes") (and all copies of any of the foregoing, including "copies" that have been converted to computerized media in the form of image, data or word processing files either manually or by image capture) based on or including any Confidential Information, in whatever form of storage or retrieval, upon the earlier of (i) the completion or termination of the dealings between the parties contemplated hereunder; (ii) the termination of this Agreement; or (iii) any breach of this agreement, in which case the party in breach shall also be liable towards the Disclosers under the law and this Agreement or (iv) at such time as the respective Discloser may so request; provided however that the Recipient may retain such of its documents as is necessary to enable it to comply with its document retention policies. Alternatively, the Recipient, with the written consent of the respective Discloser may immediately destroy any of the foregoing embodying Confidential Information (or the reasonably non-recoverable data erasure of computerized data) and, upon request, certify in writing such destruction by an authorized officer of the Recipient supervising the destruction).

13. Notice of Breach

Recipient shall notify the Disclosers immediately upon discovery of any unauthorized use or disclosure of Confidential Information by Recipient or its Representatives, or any other breach of this Agreement by Recipient or its Representatives, and will cooperate with efforts by the Discloser regain possession of Confidential Information and prevent its further unauthorized use.

14. <u>Survival</u>

The provisions of Clauses 8, 9 & 10 of this Agreement, and the rights and obligations contained there under shall not terminate upon termination of this Agreement.

15. Governing Law & Dispute Resolution

The contract shall be governed by the Law for the time being in force in the Republic of India. Civil Court having original Civil Jurisdiction at (name of Place) shall alone have exclusive jurisdiction in regard to all matters in respect of this agreement.

Except as provided elsewhere in this Contract, in case amicable settlement is not reached between the Parties, in respect of any dispute or difference; arising out of the formation, breach, termination, validity or execution of the Contract; 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 to arbitration. The arbitration shall be conducted by three arbitrators, one to be appointed by each of the Parties and a third arbitrator to be appointed by the mutual consent of the two arbitrators so appointed by the Parties.

The Arbitrator shall pass a reasoned award and the award of the Arbitrator shall be final and binding upon the Parties. Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India) or 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 _____(the place from where the contract is issued)

16. No Publication

Neither Party shall disclose, publicise or advertise in any manner the discussions or negotiations contemplated by the Agreement without the prior written consent of the other Party, except as may be required by law.

17. Miscellaneous

(a) This Agreement constitutes the entire understanding between the parties and supersedes any and all prior or contemporaneous understandings and agreements, whether oral or written, between the parties, with respect to the subject matter hereof. This Agreement can only be modified by a written amendment signed by the party against whom enforcement of such modification is sought.

(b) Any failure by a Discloser to enforce the Recipient's strict performance of any provision of this Agreement will not constitute a waiver of its right to subsequently enforce such provision or any other provision of this Agreement.

(c) Although the restrictions contained in this Agreement are considered by the parties to be reasonable for the purpose of protecting the Confidential Information, if any such restriction is found by a court of competent jurisdiction to be unenforceable, such provision will be modified, rewritten or interpreted to include as much of its nature and scope as will render it enforceable. If it cannot be so modified, rewritten or interpreted to be enforceable in any respect, it will not be given effect, and the remainder of the Agreement will be enforced as if such provision was not included.

(d) Any notices or communications required or permitted to be given hereunder may be delivered by hand, deposited with a nationally recognized overnight carrier, electronic-mail, or mailed by certified mail, return receipt requested, postage prepaid, in each case, to the address of the other party first indicated above (or such other addressee as may be furnished by a party in accordance with this paragraph). All such notices or communications shall be deemed to have been given and received (a) in the case of personal delivery or electronic-mail, on the date of such delivery, and (b) in the case of delivery by a nationally recognized overnight carrier, on the third business day following dispatch.

(e) Parties shall not directly or indirectly assign or transfer it by operation of law or otherwise without the prior written consent of the Disclosers, which consent will not be unreasonably withheld. All obligations contained in this Agreement shall extend to and be binding upon the parties to this Agreement and their respective successors, assigns and designees.

(f) Paragraph headings used in this Agreement are for reference only and shall not be used or relied upon in the interpretation of this Agreement.

18. <u>Notices</u>

All notices, documents, consents, approvals or other communications (a `Notice') to be given hereunder shall be in writing and shall be transmitted by first class registered or recorded delivery mail to the person at the address specified herein below, or by telex, facsimile or other electronic means in a form generating a record copy to the party being served at the relevant address for that party shown herein below. Any Notice sent by mail shall be deemed to have been duly served on receipt of delivery confirmation. Any Notice sent by telex facsimile or other electronic means shall be deemed to have been duly served at the time of transmission.

Notice if to:

BHEL, then to,

_____

_____

Phone :

[redacted]

Fax :

E-mail :

ABC, then to,

(Name)_____

(Designation)_____

Phone :

Fax :

E-mail :

19. Counterparts, Telefax Signatures

This Agreement may be signed in two counterparts, each of which is to be considered an original, and taken together as one and the same document.

IN WITNESS WHEREOF, of their Agreement to the terms and conditions contained herein, the undersigned have caused this Agreement to be executed by their duly authorized representatives:

For Bharat Heavy Electricals Limited	**For ABC**
Signature: ..... **Name:** **Designation:**	**Signature: .....** **Name:** **Designation:**
Signature: ..... **Name:** **Designation:**	**Signature: .....** **Name:** **Designation:**

BOTH SIDED