BUYERS SPECIFIC ADDITIONAL TERMS & CONDITIONS

ITEM NAME: Leak Steam Valve along with spares

PROJECTS- Raipur Unit-1 & 2 (Ph-2), Mirzapur Unit-1 & 2 (PH-1), Kawai Unit-1 & 2 (PH -II), Kawai Unit-1 & 2 (Ph-III) & Mahan Unit-1 & 2 (PH-III)

1. SCOPE OF ENQUIRY:

E-bids on GeM portal are invited from bidders for the supply of Leak Steam Valve for Raipur Unit-1 & 2 (Ph-2), Mirzapur Unit-1 & 2 (PH-1), Kawai Unit-1 & 2 (PH -II), Kawai Unit-1 & 2 (Ph-III) & Mahan Unit-1 & 2 (PH-III) as per requirement mentioned below:

ITEM-NO	MATERIAL CODE & ITEM DESCRIPTION	QTY.	UNIT	DATE FOR SUPPLY COMPLETION	PROJECT	Dely. Start After	Dely. Completion By
1	W90313240450 DRG: 21324052100 REV:00 LEAK OFF STEAM VALVE WITH PNEUMATIC ACTUATOR	10 Set	10	31-07-2026	Raipur Unit-1	173	263
				31-01-2027	Raipur Unit-2	357	447
				31-01-2027	Mirzapur Unit-1	357	447
				30-07-2027	Mirzapur Unit-2	537	627
				30-07-2027	Kawai PH-II Unit-1	537	627
				30-01-2028	Kawai PH-II Unit-2	721	811
				30-10-2027	Kawai PH-III Unit-1	629	719
				30-04-2028	Kawai PH-III Unit-2	812	902
				31-08-2027	Mahan PH-III Unit-1	569	659
				29-02-2028	Mahan PH-III Unit-2	751	841
2	W99313240599 DRG: 31324052110 REV:00 SPARES:LEAK OFF STEAM VALVE	4 Set	4	31-03-2027	Raipur Unit-1	416	506
				30-09-2027	Mirzapur Unit-1	599	689
				30-07-2028	Kawai PH-II Unit-1	903	993
				30-10-2028	Kawai PH-III Unit-1	995	1085
2	W99318102100 DRG: AS PER ADDENDUM NO-41810250001 REV:00 POSITIONER WITH POSITION TRANSMITTER FOR LEAK STEAM VALVE AS PER ADDENDUM NO.-41810250001.	4 No.	4	31-03-2027	Raipur Unit-1	416	506
				30-09-2027	Mirzapur Unit-1	599	689
				30-07-2028	Kawai PH-II Unit-1	903	993
				30-10-2028	Kawai PH-III Unit-1	995	1085

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2. Project Detail with consignee address:

[a] Project Name	**2X800 MW APL Raipur (Ph-II)**
Consignee Address	Adani Power Limited Village: Raikheda Block: Tilda, Raipur 493225 Chhattisgarh
[b] Project Name	**2X800 MW Mirzapur PH-I**
Consignee Address	Mirzapur Thermal Energy (UP) Private Limited Village: Dadri Khurd; PO: Darhi Ram Tehsil: Sadar, District: Mirzapur 231 304 Uttar Pradesh
[c] Project Name	**2X800 MW KAWAI PH-II**
Consignee Address	Adani Power limited, Kawai, 2 x 800 MW(Phase-II) Thermal Power project, Village - Kawai, Tehsil - Atru, Baran -District, Rajasthan Pin-325219
[d] Project Name	**2X800 MW KAWAI PH-III**
Consignee Address	Adani Power limited, Kawai, 2 x 800 MW(Phase-III) Thermal Power project, Village - Kawai, Tehsil - Atru, Baran -District, Rajasthan PIN-325219
[e] Project Name	**2X800 MW Mahan TPP (PH-III)**
Consignee Address	Mahan Energen Limited 2x800 MW (Phase-III) Mahan Ultra Supercritical Thermal Power Project, Village: Bandhoura, Karsualal Tehsil: Waidhan, District-Singrauli, Pin - 486886, Madhya Pradesh

3. EARNEST MONEY DEPOSIT (EMD):

All interested vendors must submit their e-bid along with the proof of submission of following Earnest Money Deposit (EMD) details in GeM portal along with offer. EMD is exempted as per GeM provisions applicable on GeM & mentioned at para no. 3.2 of this ATC.

Details	Amount In INR	Type
EMD	INR 6,00,000/- (Six lakhs only)	Refundable

3.1: Modes of deposit: The EMD may be accepted only in the following forms:

(i) Electronic Fund Transfer credited in BHEL account (before tender opening).
(ii) Banker's cheque/ Pay order/ Demand draft, in favour of BHEL (along with offer).
(iii) Fixed Deposit Receipt (FDR).
(iv) Bank Guarantee from any of the Scheduled Banks.
(v) Insurance Surety Bonds.
(vi) The EMD shall remain valid for a period of 45 (forty-five) days beyond the final bid validity period as asked in NIT.

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For E-Payment, the RTGS details are as mentioned below:

Bank Details	SWIFT Details of bank	Contact Details of Banker
STATE BANK OF INDIA RANIPUR BRANCH, OPP: BHEL MAIN GATE, SECTOR-5, RANIPUR, HARIDWAR, UTTRAKHAND, INDIA PIN CODE: 249403	SWIFT NO : SBININBB225 CC ACCOUNT NO : 10667995458 IFSC CODE : SBIN0000586	Contact No. +91 1334 224201 +91 1334 226125 Fax: +91 1334 226512

3.2: Exemption of EMD

As per GeM GTC following are the exempted category of EMD/Bid Security.

a. Micro and Small Enterprises (MSEs) who are holding valid Udyam Registration and are manufacturer of the offered Productor Service (Primary Product / Service - in case of bunch bid with total value wise evaluation) and give specific confirmation to this effect at the time of bid submission and claim EMD exemption and whose credentials are validated online through Udyam Registration website of Ministry of MSME and also through supporting document uploaded during bidding process and validated by the Buyer. State Government Buyers may, however, choose to exempt only MSEs from the State of Bid Inviting Authority by specifying the same in ATC of the Bid. In case no such ATC is included, eligible MSEs of all states are exempted.

b. Start-ups as recognized by Department for Promotion of Industry and Internal Trade (DPIIT), holding valid Start-up Recognition Certificate which is to be uploaded while bidding and claiming EMD exemption and to be validated by the Buyer. Bidder to ensure that turnover for any of the financial years has not exceeded beyond limits prescribed in the certificate / Start Up scheme of DPIIT.

c. KVIC, ACASH, WDO, Coir Board, TRIFED and Kendriya Bhandar.

d. Sellers who have got their credentials verified through the process of Vendor Assessment by Vendor Assessment Agencies for the Primary Product / Primary Service for which Bid / RA has been invited and holding valid Vendor Assessment or Vendor Assessment Exemption Report / confirmation (Seller to upload VA report / VAE confirmation to be validated by the Buyer).

e. Sellers / Service Provider having annual turnover of INR 500 Crore or more, at least in one of the past three completed financial year(s)

f. Sellers / Service Providers holding valid BIS License for the Primary Product Category whose credentials are validated through BIS database and through uploaded supporting documents to be validated by the buyer.

g. Central / State PSUs.

h. In addition to above GeM conditions, offers directly from the manufacturer or their authorized agents are also exempted from submission of EMD.

3.3: Forfeiture of EMD:

a. A bidder's EMD will be forfeited if the bidder withdraws or amends its/his tender or impairs or derogates from the tender in any respect within the period of validity of the tender or if the successful bidder fails to furnish the required performance security within the specified period mentioned in the Tender.

b. EMD by the tenderer to be withheld in case any action on the bidder is envisaged under the provisions of extant "Guidelines on Suspension of business dealings with suppliers/ contractors" and forfeited/ released based on the action as determined under these guidelines.

c. Bid securities of the unsuccessful bidders shall be returned to them after expiry of the final bid validity period / latest by the 30th day after the award of the contract. Since it is a two-part bidding, bid securities of unsuccessful bidders during first stage i.e. technical evaluation shall be returned within 30 days of declaration of result of first stage i.e. technical evaluation.

d. Bid security/EMD of the successful bidder shall be returned only on conclusion of the order and receipt of a Performance Security/Performance Bank Guarantee of 10% of contract value (excluding taxes) from contractor / Supplier.

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e. EMD/PBG/PS shall not carry any interest.

4. PERFORMANCE SECURITY/PERFORMANCE BANK GUARANTEE:

Successful bidder to submit Performance Security/Performance Bank Guarantee of 5% of the contract Value (Excluding Taxes). The Performance Security/PBG shall be submitted within 30 days of notification of the award of Contract and it should remain valid for a period of 60 (sixty) days beyond the date of completion of all contractual obligations of the supplier, including warranty obligations.

PS/PBG shall be returned to the contractor without interest, after the contractor duly performs and completes the contract in all respects but not later than 60 (sixty) days of completion of all such obligations including the warranty under the contract. The Performance Security/PBG shall not carry any interest.

4.1 Modes of deposit of PS/ PBG: Performance Security/Performance Bank Guarantee shall be furnished in the following forms:

I. Local cheques of Scheduled Banks (subject to realization)/ Pay Order/Demand Draft/ Electronic Fund Transfer in favour of BHEL.
II. Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format should have the approval of BHEL.
III. Fixed Deposit Receipt issued by Scheduled Banks / Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL).
IV. Securities available from Indian Post offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security and duly endorsed/ hypothecated/ pledged, as applicable, in favour of BHEL).
V. Insurance Surety Bond.

(Note: BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith)

4.2: Forfeiture of Performance Security/Performance Bank Guarantee:

The Performance Security/ Performance Bank Guarantee will be forfeited and credited to BHEL's account in the event of a breach of contract by the supplier.

4.3: Performance Security shall be refunded to the Supplier/Vendor without interest, after the Supplier/Vendor duly performs and completes the contract in all respects but not later than 60(sixty) days of completion of all such obligations including the warranty under the contract.

4.4 : The Performance Security shall not carry any interest.

4.5 : There is no exemption of Performance security deposit submission for MSE Vendors.

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3.BUYERS SPECIFIC ADDITIONAL TERMS & CONDITIONS IN ADDITION TO GTC

Sl. No.	Terms	Description	Supplier confirmation
1.	**Documents Checklist:**	Please submit signed and stamped copy of your offer on each page along with following documents; • Buyer Specific T&C. • Technical PQR & its supportive document. • Technical drawing & purchase specification. • Certificate/self-certification for minimum local content as per PPP-MII order. • Replica of price bid schedule without prices with part-I offer.	
2.	**Special Instruction of Technical requirement**	PLEASE ENSURE TO SUBMIT PRICE OFFER AGAINST EACH ITEM MENTIONED IN THE BHEL DRAWING NO. 31324000001 FOR OUR FUTURE REFERENCE AND ORDERING (IF REQUIRED). PLEASE ALSO CONFIRM THAT YOUR PRICES OF THESE ITEMS SHALL BE VALID TILL ENTIRE GUARANTEE PERIOD.	
		AT THE TIME OF OFFER ALL THE VENDORS TO ENSURE TO FURNISH DULY FILLED CHECK LIST FOR LEAK OFF STEAM VALVE (AS PER ANNEXURE-B) TO CONFIRM BHEL SPECIFICATION REQUIREMENTS.	
		AT THE TIME OF OFFER ALL THE VENDORS TO ENSURE TO FURNISH DULY FILLED ANNEXURE-C AND SUBMIT ALL THE DOCUMENTS ACCORDINGLY.	
		VENDOR TO SUBMIT PACKING LIST OF ITEMS FOR BHEL REVIEW AFTER PLACEMENT OF P.O. AND BEFORE DISPATCH.	
		MANDATORY SPARES SHALL BE PACKED IN A SEPERATE GREEN COLOR BOX WITH "MANDATORY SPARES FOR LEAK OFF STEAM VALVE" LABLLED ON IT.	
		ADDITIONAL SPECIFICATION FOR SMART TYPE POSITIONER AS PER DOCUMENT NO. 41810250001 REV05 DTD. 28/02/2025 SHALL BE COMPILED BY ALL THE VENDORS.	
		THE VENDOR TO PROVIDE 3D MODELS FOR THE SUPPLIED EQUIPMENT ASSEMBLIES (HAVING ALL THE COMPONENTS INCLUDED) COMPLETE WITH ALL CONNECTIONS POINTS/INTERFACES FOR THE PURPOSE OF 3D POWER PLANT LAYOUT TO BE DONE BY BHEL AS PER CUSTOMER SPECIFICATION REQUIREMENTS. THE FILE FORMAT FOR 3D MODELS SHALL BE INFORMED BY BHEL AND THE SAME SHALL BE SUBJECT TO CUSTOMER APPROVAL.	
		IN CASE OF ANY CONFLICT BETWEEN STIPULATIONS IN VARIOUS PORTIONS OF THE SPECIFICATION, MOST STRINGENT STIPULATION WOULD BE APPLICABLE FOR IMPLEMENTATION BY THE VENDOR WITHOUT ANY EXTRA COST TO BHEL.	
		SPECIAL TOOLS AND TACKLES/ EQUIPMENT FOR THE OPERATION, MAINTENANCE, INSPECTION AND REPAIR OF THE EQUIPMENT SHALL BE SUPPLIED BY THE VENDOR WHICH SHALL BE NEW AND UNUSED. SPECIAL TOOLS AND TACKLES/ EQUIPMENT SHALL BE DELIVERED BY THE VENDOR IN LOCKABLE STEEL BOXES AND SHALL BE MARKED FOR IDENTIFICATION PURPOSES ALONGWITH CORRESPONDING TOOL CHART.	
		ALL THE SPARES MUST BE PACKED IN SEALED TRANSPARENT PLASTIC BAGS AND CLEARLY MARKED OR LABELLED ON THE OUTSIDE OF THE PACKING WITH ITS DESCRIPTION AND ASSEMBLY PART NUMBERS CORRELATED WITH BHEL APPROVED DRAWING AND BILL OF MATERIAL (BOM).	
		THE VENDOR TO READ CLAUSE NO. 1.8 OF BHEL SPECIFICATION 21324052100 SH02 AS FOLLOWS- - VALVE MUST BE DESIGNED KEEPING IN VIEW OF THE RESPECTIVE SITE DATA AS PER: A. ANNEXURE-F_ RAIPUR(PH-II)TPP B. ANNEXURE-F_ MIRZAPUR(PH-I)TPP C. ANNEXURE-F_ KAWAI(PH-II & PH-III) TPP D. ANNEXURE-F_ MAHAN(PH-III)TPP	
3.	**Compliance of GTC on GeM**	General Terms and Conditions on GeM 4.0 (Version 1.22) Dtd -28/02/2025 or it's latest revision of GeM portal shall be applicable against this enquiry. Kindly confirm to	

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		compliance the same for this tender.	
4.	**Pre-Qualification Requirements**	The Pre-Qualification Requirements have been compiled. All the bidders should ensure submission of complete details and documents as called for in these requirements. The Offers submitted by the bidders would be scrutinized with respect to Pre-Qualification Requirements first. Techno-Commercial offer of only those bidders shall be evaluated who meet the Pre-Qualification Requirements.	
5.	**Customer approval requirement**	Bidders are requested to submit their credentials along with offer (Credentials should include BHEL P.O.s on vendor for the same rating or higher rating turbines, Experience of vendor with state utilities and major PSU like NTPC, End User Certificate wherever available), in order to take up with end customer for approval Supplier to submit following credentials for arranging Customer approval: - • Company Profile • List of Order Executed/ on hand for Power Sector/Gov. organization of same /similar items • Copy of Major Supply Orders • Performance Certificates for Satisfactory working of System/ Equipment from end users Item. **The offer of only those bidders, who meet Pre-qualification requirement (PQR), Technical requirement and approved by the End Customer, will be considered for price-bid opening & RA for the requirement against this enquiry.**	
6.	**Make in India Clause**	"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 Ref. No. P-45021/2/2017-PP (BE-II) dtd. 04/06/2020 issued by DPIIT. In case of subsequent orders issued, by the nodal ministry, changing the definition of local content for the items of this NIT, but before opening of Part-II bids against this NIT As per Make in India Order, only Class-1 and Class-2 local supplies are eligible to bid in this tender enquiry. For this eligibility criteria, bidders are required to submit certificate of Minimum local content as specified in attached Make In India Declaration format.	
7.	**Compliance of Rule 144 (xi) of GFR 2017**	Compliance of Restrictions under Rule 144 (xi) of GFR 2017 shall be as per GeM.	
8.	**Bid validity/ Validity of offer**	Please note that validity of the offer shall be 180 days from the date opening of Techno-Commercial bid (Part-I bid) on GeM portal. Offer of bidder's having validity less than 180 days shall liable to reject. Please confirm.	
		The required validity is considering that offer is complete & clear w.r.t. PQR and all techno-commercial conditions. Vendors need to extend their offer validity for the time taken by them in responding BHEL's comments/clarification sought during techno-commercial scrutiny of the offer. In case regret by any bidder for such validity extension, their offer shall liable to be reject. Please confirm.	
9.	**Loading and unloading**	Vendor's scope will not cover Loading & Unloading at Final destination of delivery. Unloading at final destination (i.e. BHEL site) is in BHEL 'scope. Loading and unloading at other intermediate places due to any permitted transhipment will be the responsibility of the vendor. Kindly note	
10.	**Prices/Basis of Quotation**	The offered prices of the items shall remain firm and fixed till the execution of the contract, kindly confirm.	
		Kindly confirm that your quote prices are inclusive of P&F, Freight & GST for Total quantity on GeM portal.	
		Transit Insurance would be arranged by BHEL. Please quote your prices accordingly.	

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<table>
<tr><td></td><td></td><td>The prices are to be quoted on Ex-Works with freight Pre-paid up to project destination basis. The goods must be dispatched through any Bank approved transporters having their branch at Haridwar. The names and addresses of transporters approved by IBA as well as BHEL are posted at our website www.bhelhwr.co.in. Please note that, if you dispatch the material by any BHEL un-approved transporter then you will necessarily be required to furnish the MRC (Material Receipt Certificate) from respective Project Site for processing of your invoice. No demurrage charges would be borne by BHEL.</td><td></td></tr>
<tr><td>11.</td><td>Special Instructions:</td><td>a. ADADNI projects:

• Please inform 8 digit HSN code for Leak Steam Valve along with spares.
• 08 DIGIT GST HSN CODE to be provided & mentioned in your invoice & packing list.
• Invoice, GR/LR, packing list, Test certificate are required in original for billing to end user.
• Loose items one marker board needs to be send for each bundle for fixing RFID tag at site.
• Material for unit-1, unit-2, commissioning spares and mandatory spares needs to be packed in separate boxes and same is required to be marked on the box & packing list.
• Vendor to ensure submission billing documents in the same month of material despatch. If vendor fail to provide the despatch documents in the same month GST Penalty shall be applicable and bear by vendor as per GST rule.</td><td></td></tr>
<tr><td>12.</td><td>Evaluation criteria</td><td>Evaluation shall be done on total landed cost up to BHEL Project Sites considering both material codes together for complete scope of enquiry.</td><td></td></tr>
<tr><td>13.</td><td>Evaluation Currency</td><td>The evaluation currency for this tender shall be INR.</td><td></td></tr>
<tr><td>14.</td><td>Payment terms:</td><td>For Material portion:
The payment shall be done after receipt of Material at BHEL respective project site, within no. of days as defined in the below table from the date of receipt of Material at site i.e. MRC date).

<table><tr><td>Type of Bidder</td><td>Payment Terms (Number of Days)</td></tr><tr><td>Micro & Small Enterprises (MSEs)</td><td>45 days</td></tr><tr><td>Medium Enterprises</td><td>60 days</td></tr><tr><td>Non MSME</td><td>90 days</td></tr></table>
The Payment terms are subject to receipt of non-discrepant document from supplier.</td><td></td></tr>
<tr><td>15.</td><td>GeM charges</td><td>GeM charges if any shall be either side only i.e. buyer’s GeM charges shall be in buyer’s account and seller’s GeM charges shall be on seller’s account. Please confirm.</td><td></td></tr>
<tr><td>16.</td><td>Contract execution</td><td>Bidder’s are advised to read GeM related query & clarification carefully on GeM portal. Order shall be executed through GeM.</td><td></td></tr>
<tr><td>17.</td><td>Reverse Auction (E-bidding)</td><td>BHEL shall be resorting to Reverse Auction (RA) on GEM portal as per GEM functionalities for this tender. RA shall be conducted among the techno-commercially qualified bidders.</td><td></td></tr>
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18.	**Quantity Variation**	BHEL reserves the right to cancel tender or reject any or all the quotations without assigning any reasons thereof. **BHEL also reserves the right to Increase or decrease the tendered quantities or quantity of individual material code may be dropped as a whole also.** Vendors should be prepared to accept order for reduced Quantity without any extra charges. Vendor should also be prepared for giving discount in case of Increase in Quantity. Vendor has to take manufacturing clearance from BHEL before starting manufacturing of material. In case ordered quantity is reduced at the time of manufacturing clearance, then payment shall be made accordingly as per decreased quantity. Kindly confirm.	
19.	**Delivery Period**	Please note that BHEL's Delivery requirements are mentioned in point no 1 of above. Early delivery w.r.t. above lot delivery will be accepted only after written confirmation from BHEL. BHEL reserve right to reject early delivery request of bidders / suppliers. Delivery period indicated in GeM bid is only indicative and final delivery of tender shall be taken as mentioned above. Accordingly bidders to confirm the above deliveries or quote their best possible delivery in no of months / weeks from the date of placement of Purchase order, including all activities like document approval, inspection by TPI time etc.	
20.	**Technical Document/ Drawing approval conditions**	Drawings/Data sheets/documents/QAP etc. as called for in the specifications shall be submitted by Vendor for BHEL/ Customer approval within 30 days of purchase order. BHEL shall approve these drawings/data sheets/ documents / QAP etc. within 30 days of receipt. Any comments on the documents shall be given by BHEL within 7 days of submission and vendor shall submit revised document / reply to comments, within 7 days of BHEL comments. However, total time for Document submission and approval shall not exceed 30 days for respective party. Delivery is from the date of PO, accordingly, delay in submission / revision of the documents by the vendor will automatically account for to vendor. In case of delay on account of BHEL in comments / approval of the documents, the delivery shall be re-scheduled by the no of days taken by BHEL in excess to 30 days. For delay analysis cumulative no of days (including time taken in comments), shall be considered for delivery extension.	
21.	**Liquidated Damages (LD) for late delivery**	Liquidated Damages shall be lot wise as per clause no. 15 (iii) of General terms and conditions on GeM 4.0 (Version 1.22) as under: kindly confirm. "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, the Buyer 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".	
		The date of LR would be treated as the date of delivery for penalty purposes.	
22.	**MDCC clause**	Please note that, material shall be dispatched only after issue of Material dispatch clearance certificate (MDCC) from end customer. For issue of MDCC, vendors are required to submit all test certificates (TC) and inspection report of third party (IR) to BHEL. After review & acceptance of the quality document, BHEL will forward the same to end customer for issuance of MDCC. MDCC shall be issued within 7 days of receipt of complete quality documents / TCs,. In case of delay in issuance of MDCC, only delivery shall be extended by no of days taken by BHEL in excess to 7 days and all other terms and conditions of PO shall remains same & binding. In case any material is dispatched without MDCC and any loss is incurred by Supplier/Vendor for any reason whatsoever, BHEL shall not be responsible in any manner to compensate the supplier in this regard. Kindly confirm.	
23.	**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.	

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		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. 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 under above clause 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 encashing 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 encashed. 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 sub clause (a) 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.	

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		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. 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.	
24.	**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, mal-practices, 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.	
25.	**Settlement of Dispute, CONCILIATION & ARBITRATION: :**	**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 Officer / IEM for amicable resolution by the parties. Designated Officer / IEM 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 as per 'CONCILIATION' Clause. **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	

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broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as 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 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, Power Sector/ 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 (shall be identified 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 at the court(s) of 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 Haridwar , shall have exclusive jurisdiction.

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

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		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 of clause mentioned above. 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.	
26.	**Action against Bidders / vendor / supplier / contractor in case of default:**	In order to protect the commercial interests of BHEL, BHEL shall take action 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 could be in the form of "Hold" or "Banning" a supplier/ contractor or a bidder and shall be as per "Guidelines for Suspension of Business Dealings with Suppliers/ Contractors" available at BHEL's website **"https://www.bhel.com/guidelines-suspension-business-dealings-supplierscontractors"**	
27.	**MICRO AND SMALL ENTERPRISES (MSE):**	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. **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 dtd. 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. Non-submission of supporting document in GeM portal will lead to consideration of their bids at par with other bidders. 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.	
28.	**JURISDICTION:**	This contract shall be governed by the Law for the time being in force in the Republic of India. Subject to clause(s) mentioned above of this contract, the Civil Court having original Civil Jurisdiction at Haridwar shall alone have exclusive jurisdiction in regard to all matters in respect of the Contract.	
29.	**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,	

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

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		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, goslow or similar labour 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 i) Constitute a default or breach of the Contract. ii) 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	
30.	**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.	
31.	**Order of Precedence:**	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. GeM Bid Technical Conditions of Contract (TCC) d. GeM GTC	
32.	**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 authorize only one agent/dealer. There can be only one bid from the following: 1. The principal manufacturer directly or	

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<table>
<tr><td></td><td></td><td>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.</td><td></td></tr>
<tr><td rowspan="3">33.</td><td rowspan="3">Guarantee clause</td><td>Kindly confirm that Guarantee shall be provided for a period of “24 months from the date of dispatch or 18 months from the date of commissioning, whichever is earlier”. In case of any failure or trouble reported from site, the supplier should depute their representative immediately to attend the problem and replace the defective component/part if required, without any additional cost to BHEL.</td><td></td></tr>
<tr><td>Supplier shall be responsible for free replacement of defective equipment / material at our site</td><td></td></tr>
<tr><td>Please note that offers with guarantee period lesser than above mentioned guarantee period may result in rejection of the offer.</td><td></td></tr>
<tr><td>34.</td><td>Order Acceptance:</td><td>Ink signed order acceptance shall be furnished within 15 days of order placement. In case, order acceptance do not received within 15 days of order placement, PO deemed to be accepted by you.</td><td></td></tr>
<tr><td>35.</td><td>Beneficiary of PO</td><td>Kindly confirm on whom the PO will be placed in the event of ordering.</td><td></td></tr>
<tr><td>36.</td><td>Dispatch documents</td><td>Following dispatch documents to be provided immediately after directly dispatch to BHEL Project site for billing purpose:
• Guarantee/Warrantee Certificates
• E- Invoice and commercial invoice
• GeM invoice
• Original consignee copies of GR/LR/RR (Material shall be dispatched on door delivery basis without consignee copy)
• Packing list
• Original GST compliance certificate
• E-way bill
• MRC/POD/Receipted LR/RR/GR copy (as per proof of delivery of material at BHEL Project site)</td><td></td></tr>
<tr><td>37.</td><td>Integrity Pact</td><td>(a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.
<table><tr><th>Sl</th><th>IEM</th><th>Email</th></tr><tr><td>1.</td><td>Shri Otem Dai, IAS (Retd.)</td><td>iem1@bhel.in</td></tr><tr><td>2.</td><td>Shri Bishwamitra Pandey, IRAS (Retd.)</td><td>iem2@bhel.in</td></tr><tr><td>3.</td><td>Shri Mukesh Mittal, IRS (Retd.)</td><td>iem3@bhel.in</td></tr></table>(b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three-part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.
(c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.
Note:
No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc. on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department’s officials whose contact details are provided below:</td><td></td></tr>
</table>

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		Mithlesh Kumar Maurya Designation: Addl. Engineer (PPX-BOI) 4th Floor, Main Administrative Building, HEEP, BHEL, Hardwar- 249403 Uttarakhand, India Email ID: mithleshkumar.maurya@bhel.in Tel: +91 1334 28 1690	Mr. C. L. Meena Designation: Manager (PPX-BOI) 4th Floor, Main Administrative Building, HEEP, BHEL Hardwar- 249403 Uttarakhand, India Email ID: clmeena@bhel.in Tel: +91 1334 28 1685	
38.	**Additional Conditions for Assessment**	BHEL reserves the right to consider / Not-consider the offers based on the evaluation of documents submitted for the Pre-Qualification Criteria (PQR).		
		BHEL also reserves the right to have on-site assessment of the facilities at supplier's works during the bid evaluation.		
39.	**O&M Manuals**	**Kindly confirm that in the event of ordering,** 22 Sets hard copies (Paper based) and 6 SetS (in CD ROM) of O & M manual shall be furnished containing all drawings and datasheet, catalogues of all instruments and instructions for storage, erection & commissioning, operation and maintenance after approval. Please submit same to BHEL Haridwar after despatch of material.		
		Kindly confirm that in the event of ordering, 3 Sets hard copies (Paper based) and 1 Sets (in CD ROM) of O & M manual would be kept inside the dispatch box of Oil Purification Unit & the same shall also be mentioned in your Shipping/Packing List.		
40.	**Quality Requirement**	Vendor to confirm and endorse BHEL SQP QA_BI_QP_135_REV03.		
		Vendor to confirm that inspection shall be done by BHEL nominated inspection agency M/s TUV as per BHEL SQP QA_BI_QP_135_REV03.		
		For Spares: • Vendor to confirm that Testing/Witnessing/certification will be done as per approved quality plan of main item. • Vendor to confirm that If item does not appear in approved quality plan then Certificate of compliance will be provided. • Vendor to confirm that interchangeability certificate will be provided for spares.		
		All the vendors to confirm that paint material shall be procured from following manufacturer: - • Asian Paints India Ltd. • Shalimar Paints • Jotun • Akzonobel • Berger Paints • Good Lass Nerolac Paints • Bombay Paints • Jenson & Nicholson		
		The Charges for Pre-Inspection would be borne by BHEL. However at least 15 days' notice is to be provided for arranging Pre-Inspection.		
41.	**Bidder Contact details**	Please provide Contact details of your representative for techno-commercial clarifications: Mobile no. & Email id (minimum 2 person)		

SPECIAL NOTE FOR BIDDERS:

a. 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.
b. 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.
c. 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.
d. 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.
e. 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.

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f. 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.
g. If the delivery of supply as detailed above gets delayed beyond the delivery period, the Supplier/Vendor shall request for a delivery extension and BHEL at its discretion may extend the Contract. However, if any 'Delivery extension' is granted to the Supplier/Vendor for completion of supply, due to backlog attributable to the Supplier/Vendor, then it shall be without prejudice to the rights of BHEL to impose LD for the delays attributable to the Supplier/Vendor.
h. In case BHEL increase the quantity during currency of the contract in line with quantity variation clause of GeM bid, delivery extension on pro-rata basis shall be given for supply of these additional quantity.

Following documents are an integral part of this Tender Enquiry and endorsed copies of these documents (duly signed and stamped on each page, as a token of acceptance) are to be submitted/uploaded along with offer on GeM portal against this bid.

1. Please submit replica of Price schedule (without prices) showing ''quoted" in place of price along with techno-commercial bid (Part-I).
2. Please submit signed & Stamped copy (each page) of duly filled of confirmation column of "Buyers Specific Additional Terms & Conditions (ATC)" and its clause wise supporting documents where required.
3. Please submit signed & stamped copy (each page) for qualifying PQR with proper filled information and related supporting documents as mentioned in PQR.
4. Please submit signed & stamped copy (each page) of **Integrity Pact**.
5. Please submit signed & stamped copy (each page) of BHEL SQP QA_BI_QP_135_REV03.
6. Please submit certificate of Minimum local content as specified in the Make In India Certificate of the tender

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MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN			TO BE FILLED BY BHEL	TO BE FILLED BY BHEL
BHEL	VENDOR'S NAME	ITEM	LEAK OFF STEAM VALVE WITH PNEUMATIC ACTUATOR	QP NO.	QA_BI_QP_135, REV03	
				DATED	23.07.2024	
		DRG. NO.	AS PER PO			
		SPEC.	AS PER PO			
		REV	AS PER PO	Page 1 of 4		

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	D	AGENCY M	AGENCY B	AGENCY N	REMARKS
1	2	3	4	5	6	7	8	9		10			11
1.	Body / Bonnet	Mechanical Properties	CR	Physical Test	100%	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	TC	√	P	V		
		Chemical Analysis	CR	Chemical Testing	100%	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	TC	√	P	V		
		Heat Treatment	CR	Time & Temp.	100%	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	TC	√	P	V		
		Internal Soundness	CR	Radiography & UT	100%	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	IR	√	P	V		
		Hydraulic Test	CR	Hydraulic Test	100%	BHEL APPROVED DATA SHEET/DRAWING	No Leakage	IR	√	P	V		
2.	Trim (Plug, Seat, Stem)	Mechanical Properties	MA	Physical Test	100%	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	TC	√	P	V		
		Chemical Analysis	MA	Chemical Testing	100%	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	TC	√	P	V		

MANUFACTURER/SUBCONTRACTOR	Priti Kumar Ranjan Digitally signed by Priti Kumar Ranjan Date: 2024.07.23 14:45:55 +05'30'	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 ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	FOR CUSTOMER USE	APPROVED BY

MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN			TO BE FILLED BY BHEL	TO BE FILLED BY BHEL
BHEL	VENDOR'S NAME	ITEM	LEAK OFF STEAM VALVE WITH PNEUMATIC ACTUATOR	QP NO.	QA_BI_QP_135, REV03		
				DATED	23.07.2024		
		DRG. NO.	AS PER PO				
		SPEC.	AS PER PO				
		REV	AS PER PO	Page 2 of 4			

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	D	AGENCY M	AGENCY B	AGENCY N	REMARKS
1	2	3	4	5	6	7	8	9		10			11
3.	Studs and Nuts	Mechanical Properties	CR	Physical Test	One Per Lot	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	COC	√	P	V		
		Chemical Analysis	CR	Chemical Testing	One Per Lot	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	COC	√	P	V		
4.	Packing and Other Internal Parts	Material & Functional Tests	MA	As required by relevant Standard	Sample	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	COC	√	P	V		
	Actuator	Model	MA	Verify	Sample	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	COC	√	P	V		
		Functional Test	MA	Leakage	Sample	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	COC	√	P	V		
	Positioner	Model	MA	Verify	Sample	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	COC	√	P	V		

MANUFACTURER/SUBCONTRACTOR	Priti Kumar Ranjan Digitally signed by Priti Kumar Ranjan Date: 2024.07.23 14:46:10 +05'30'	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 ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	FOR CUSTOMER USE	APPROVED BY

MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN			TO BE FILLED BY BHEL	TO BE FILLED BY BHEL
BHEL	VENDOR'S NAME	ITEM	LEAK OFF STEAM VALVE WITH PNEUMATIC ACTUATOR	QP NO.	QA_BI_QP_135, REV03		
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		SPEC.	AS PER PO				
		REV	AS PER PO		Page 3 of 4		

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
		Functional Test	MA	Testing With Valve	Sample	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	COC	√	P	V		
5.	Complete Valve	Hydraulic Test	CR	Hydraulic Test	100%	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	TC	√	P	W		
		Seat Leakage Test	CR	Leak test	100%	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	TC	√	P	W		
		Packing Tightness / Gasket Leakage	CR	Leak test	100%	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	TC	√	P	W		
		Operating Test (Opening & closing Time)	CR	Performance	100%	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	TC	√	P	W		

MANUFACTURER/SUBCONTRACTOR	Priti Kumar Ranjan Digitally signed by Priti Kumar Ranjan Date: 2024.07.23 14:46:24 +05'30'	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 ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	FOR CUSTOMER USE	APPROVED BY

MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN			TO BE FILLED BY BHEL	TO BE FILLED BY BHEL
BHEL	VENDOR'S NAME	ITEM	LEAK OFF STEAM VALVE WITH PNEUMATIC ACTUATOR	QP NO.	QA_BI_QP_135, REV03		
				DATED	23.07.2024		
		DRG. NO.	AS PER PO				
		SPEC.	AS PER PO				
		REV	AS PER PO		Page 4 of 4		

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
		Flow Capacity Test	CR	Valve Full Capacity	One Per Type	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	TC	√	P	V		BHEL Approved CV Test Report
Final Inspection													
6.	Painting	Color & Thickness	MA	Coating Thickness	100%	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	TC	√	P	V		
7.	Overall Dimensions	Overall Dimensions Inspection	MA	End to End dimensions	100%	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	TC	√	P	V		
8.	Complete Valve & Packing	Verification	MA	Verification	100%	BHEL APPROVED DATA SHEET/DRAWING	BHEL APPROVED DATA SHEET/DRAWING	IR	√	P	-		

- Note:
  1. Test certificates shall be submitted clause wise mentioning respective clause on each page.
  2. Valve shall be offered for witnessing in unpainted condition.

MANUFACTURER/SUBCONTRACTOR	Priti Kumar Ranjan Digitally signed by Priti Kumar Ranjan Date: 2024.07.23 14:46:38 +05'30'	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 ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	FOR CUSTOMER USE	APPROVED BY

Document No.: STE/TG/PQR/BI181/03

Date: 16.01.2025

PQR FOR LEAK OFF STEAM VALVE

Sl. No.	Parameters	Vender's response
1	The vendor should have experience of design, manufacturing & testing of control valve as per following details: 1.1 Design pressure: 16 bar or above 1.2 Design temperature: 500 °C or above 1.3 Valve size: 12" or above 1.4 Working medium: steam 1.5 ANSI class of the supplied valves shall be ANSI 300 or higher 1.6 Operating time for full control stroke shall be less than 3 seconds 1.7 Valve leakage class: Class IV or higher as per ANSI FCI 70-2 1.8 Actuators of the valve shall be pneumatically operated 1.9 The vendor shall have experience of SMART type positioner	Yes/ No
2	The vendor should have experience of supplying the valve satisfying all the conditions referred at point no. 1 above for at least one steam turbine power plant of rating 210MW or above, which has been commissioned at least one year as on date of issuance of enquiry. The vendor to submit experience details as per **Annexure-A** along with relevant documents of supplied valve & its actuator along with accessories like datasheets & drawings etc. to support their claim. **OR** The vendor should have experience of successfully manufacturing and testing of control valve meeting minimum parameters as per clause 1 above for BHEL, Haridwar during last 10 years as on date of issuance of enquiry. Accordingly, in support of above the supplier to submit the following documents- - PO copy - Drawing and datasheet of the control valve - Test certificates/reports	Yes/ No Yes/ No

Note: -

1. Against vendor's replies, BHEL reserves the right to ask for more information/documents/clarifications. Vendor's offer shall not be considered if vendor fails to furnish the document/information/clarifications as mentioned above or vendor doesn't meet the above acceptance criteria.
2. The vendor should furnish all the documents in English language only. If the documents are not in English, then they must be accompanied by duly certified English translations of the same.
3. BHEL team may visit Supplier works to assess Supplier's manufacturing and testing facilities, if required.

	STE-TG	CIE
Prepared by	(LEELPAT SINGH)	
Checked by	(Shubham Mittal) (NAVNIT NIRAN)	
Review by	(VISHAL SRIVASTAVA)	
Approved by	(Vivek Sharan)	

ANNEXURE-A

Experience details for leak off steam valve:

Sl. No.	Description	Applicable data	
		As per BHEL requirement	As per vendor's experience
1.	Name of power station and its location		
2.	Client name and its address, email & contact No.		
3.	Name and designation of the responsible person in client's organization /Power plant		
4.	Capacity in MW of unit	**210 MW or above**	
5.	P.O. no. and date		
6.	Date of commissioning of above project		
7.	Manufactured by		
8.	Evidence of supplying the valve for above mentioned project viz. invoice copy & commissioning report /end user certificate (shall not be more than 10 years old as on date of issuance of enquiry)		
9.	Design parameters		
	Design pressure	**16 bar(a) or above**	
	Design temperature	**500 °C or above**	
10.	Size of the valve	**≥ 12"**	
11.	Operating time of actuators (open/close)	**< 3 sec**	
12.	Leakage class	**Class IV or above as per ANSI FCI 70-2**	
13.	Valve class	**ASME 300 or higher**	
14.	Type of actuator	**Pneumatically actuated**	
15.	Working medium	**Steam**	
16.	Valve type	**Control valve**	
17.	Type of body	**Globe**	
18.	Positioner Type	**SMART type**	

TABLE–1: VALVE DATA:–

OPERATING PARAMETERS	OPERATING CONDITION	
	CASE–1	CASE–2
INLET PRESSURE bar(a)	1.048	
INLET TEMPERATURE (°C)	332	430
FLOW RATE (Kg/sec.)	1.22	2.82
OUTLET PRESSURE bar(a)	0.4	
FLUID	STEAM	
DESIGN PRESSURE bar(a)	16 bar	
DESIGN TEMPERATURE (°C)	590	

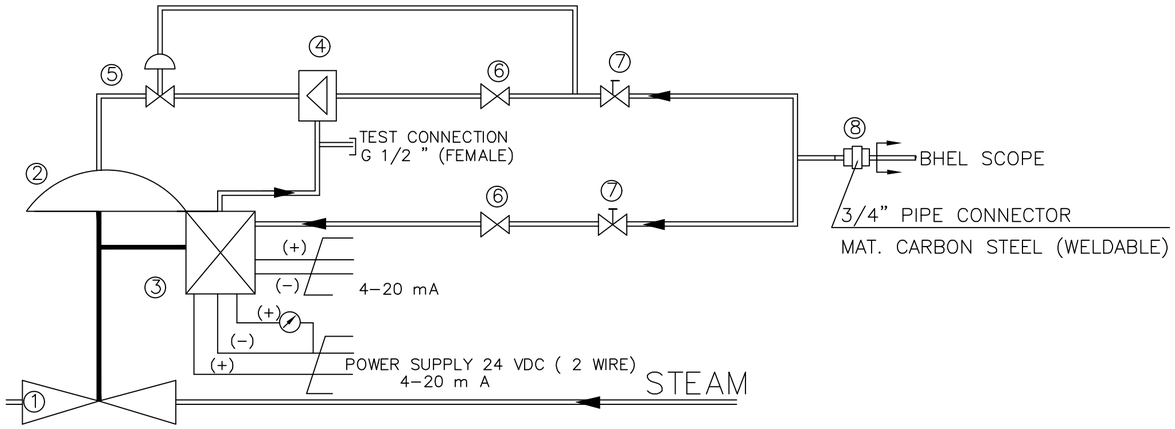

FIG.1: SCHEMATIC DIAGRAM FOR LEAKAGE STEAM CONTROL VALVE

TABLE–2: ACTUATOR DATA:–

TYPE	ELECTRO–PNEUMATIC
INPUT SIGNAL	4 TO 20 mA.
OPERATING TIME FOR FULL CONTROL STROKE	<3 sec.
△P ACTUATOR	2 bar
TYPE OF DRIVE	DIAPHRAGM
FAILURE MODE	STAYPUT
PRESSURE OF CONTROL AIR SUPPLY AHEAD OF ACTUATOR (MAX/MIN.)	10/5 bar(g)
PNEUMATIC CONNECTION	3/4" WELDABLE
POSITIONER	I/P – POSITIONER (SMART TYPE)
ELECTRONIC POSITION FEEDBACK TRANSMITTER FOR BHEL USE	2 WIRE TYPE 4~20 mA OUTPUT, 24 V DC

TABLE–4:

ITEM DESCRIPTION
1. CONTROL VALVE FUNCTION: AIR TO OPEN SPRING TO CLOSE.
2. PNEUMATIC ACTUATOR: SPRING–DIAPHRAGM TYPE
3. I/P–POSITIONER
4. AIR VOLUME BOOSTER
5. BLOCKING VALVE
6. FILTER AND REDUCING STATION
7. STOP VALVE
8. 3/4" PIPE CONNECTOR

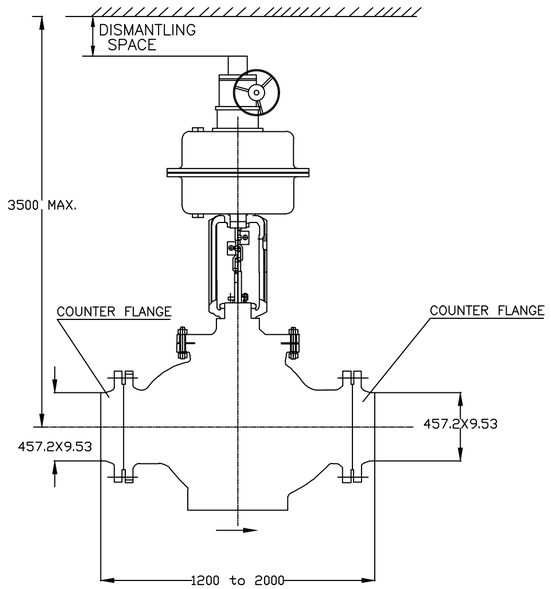

FIG.2: PROPOSED ARRANGEMENT OF LEAKEGE STEAM CONTROL VALVE (REFER SH.2, T.R. 1.3)

TABLE–3: END CONNECTION DETAIL(i.e. COUNTER FLANGES, REFER SH.2, T.R. 1.3):–

END CONNECTION	NOMINAL DIA.	SIZE		TYPE OF CONNECTION	WELD FIG./ FORM
		OUTER DIA.(mm)	WALL THICKNESS(mm)		
INLET	18"	457.2	9.53	BUTT WELDED	FIG.4 AS PER ASME B16.25
OUTLET	18"	457.2	9.53	BUTT WELDED	FIG.4 AS PER ASME B16.25

MAT. CODE : W90313240450

NOTE:

FOR TECHNICAL REQUIREMENTS REFER SHEET–2.

REV	DATE	ALTERED / CHECKED
02	01.03.25	ALTERED H.SINGH –SD– / CHECKED L.P.SINGH –SD–
		CHANGES MADE ONLY IN DRG. SHEET NO.2 AS PER C/R NO. SSTEHS_000305.
01	24.06.24	ALTERED H.SINGH –SD– / CHECKED L.P.SINGH –SD–
		CHANGES MADE ONLY IN DRG. SHEET NO.2 AS PER C/A NO. STE–24–F0145.

GRADE OF UNTOL.DIM
M/CG.–Ø/M/F AA0230208
WELDING–A/B/Ø/D AA0621104
GAS CUTTING–'T3'AA0621101

GMS No./ CBOM No.

AGREED DEPT	NAME	SIGN	STATUS OF DRG	DATE
CIE	MUDIT	–SD–	U	29.11.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: STEAM TURBINE

BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR

	NAME	SIGN	DATE
DRN	H. SINGH	– sd –	24.11.23
CHD	L.P.SINGH	– sd –	25.11.23
APPD	V.SRIVASTAVA	– sd –	29.11.23

NO. OF VAR –

DEPT	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM No.	NO. OF ITEMS
STE	N.T.S.	–	–	–	–
CODE 4011					

TITLE: LEAK STEAM CONTROL VALVE WITH PNEU. ACT.

CARD CODE

DRAWING NO. 2–13240–52100 –

SHEET No. 01 | No. OF SHEETS 02

Ref.Drawing No. 2–13240–11200

Sign & Date

Inventory No

SIZE A2

TECHNICAL REQUIREMENTS:

1. DESIGN AND MANUFACTURING REQUIREMENTS:

1.1 THE OFFERED VALVE, ACTUATOR & ACCESSORIES SHALL CONFORM TO CUSTOMER TECHNICAL SPECIFICATIONS AS PER ANNEXURE-D.

1.2 SUPPLIER TO OFFER THE VALVE & ACTUATOR SUITING TO THE INPUT PARAMETERS AS SPECIFIED IN THE TABLE-1 & 2. SUPPLIER TO KEEP ATLEAST 10% MARGIN OVER THE REQUIRED Cv WHILE SELECTING THE VALVE.

1.3(i) VALVE SHALL BE FLANGED ENDED AT INLET/OUTLET AND COUNTER FLANGES (RAISED FACE & WELDING NECK TYPE CONFORMING TO ASME B16.5-2003) OF MATERIAL GRADE ASTM A182 Gr. F91 SHALL BE SUPPLIED BY THE VENDOR ALONG WITH ASSOCIATED FASTENERS AND SEALINGS. END CONNECTIONS OF COUNTER FLANGES SHALL BE PROVIDED AS PER TABLE-3 TO MATCH WITH THE PIPES IN BHEL SCOPE. EXPANDER/REDUCER, IF REQUIRED, SHALL BE PROVIDED BY THE SUPPLIER OF MATERIAL GRADE ASTM A182 Gr. F91. ALTERNATIVELY, COUNTER FLANGES & EXPANDER/REDUCER OF MATERIAL GRADE ASTM A217 Gr. C12A IS ALSO ACCEPTABLE PROVIDED RT SHALL BE CARRIED OUT AS PER PROCEDURE MENTIONED IN ASME B16.34 & ACCEPTANCE CRITERIA SHALL BE SEVERITY LEVEL-1 AS PER ASTM E446/ASTM E280 DEPENDING UPON APPLICABLE THICKNESS.

1.3(ii) HORIZONTAL & VERTICAL DIMENSION LIMITS SHOWN IN THE PROPOSED ARRANGEMENT DRAWING OF VALVE SHALL BE COMPLIED BY THE VENDOR. WEIGHT OF THE COMPLETE ASSEMBLY OF VALVE INCLUDING ACTUATOR SHALL NOT EXCEED 2000 KG.

1.4 VALVE BODY MATERIAL SHALL CONFORM TO ASTM A217 Gr. C12A.

1.5 VALVE CLASS: ASME 300.

1.6 VALVE CHARACTERISTICS SHALL BE EQUAL PERCENTAGE.

1.7 VALVE LEAKAGE CLASS: CLASS V AS PER ANSI FCI 70-2.

1.8 THE VALVE MUST BE DESIGNED KEEPING IN VIEW OF THE SITE DATA AS PER ANNEXURE-F.

1.9 FUNCTION OF VALVE ACTUATOR SHALL BE 'AIR TO OPEN AND SPRING TO CLOSE'.

1.10 SMART TYPE POSITIONER, AIR VOLUME BOOSTER, AIR LOCKING SYSTEM FOR STAYPUT ACTION, FILTERS, STOP VALVES, ASSOCIATED PIPES AND PIPE CONNECTORS SHALL BE SUPPLIED BY THE VENDOR ALONG WITH THE ACTUATOR.

1.11 MOUNTING POSITION OF THE VALVE SHALL BE HORIZONTAL WITH VERTICAL SPINDLE.

1.12 HANDWHEEL SHALL BE PROVIDED IN THE ACTUATOR FOR MANUAL OPERATION. PROVISION SHALL BE MADE BY THE VENDOR FOR MANUAL RELEASE OF AIR WHICH GETS TRAPPED IN THE ACTUATOR IN CASE VALVE IS ON 'STAYPUT' DURING AIR SUPPLY FAILURE.

1.13 THE FOLLOWING ITEMS SHALL BE INCLUDED IN THE OFFER AS COMMISSIONING SPARES:
(i) PACKING AND GASKETS: 1 SET
(ii) LOCK WASHER FOR FLANGE: 1 COMPLETE SET FOR EACH FLANGE CONNECTION.

1.14 GASKET MATERIAL MUST BE PROVIDED FREE FROM HARMFUL POLLUTION LIKE ASBESTOS AND FERRITE AND SHOULD HAVE AN EXTRAORDINARY TEMPERATURE RESISTANCE.

1.15 THE VALVE SHALL BE IBR APPROVED.

1.16 THE VALVE SIZING SHALL BE SUITABLE FOR OBTAINING MAXIMUM OPERATING CONDITIONS WITH VALVE OPENING AT APPROXIMATELY 80% OF TOTAL TRAVEL. VALVES SHALL BE OPEN NOT LESS THAN 15 % OF FULL OPENING FOR MINIMUM FLOW CONDITION AND SHALL BE CAPABLE OF HANDLING AT LEAST 120% OF THE REQUIRED MAXIMUM FLOW AT FULL OPEN CONDITION. 02

2. TESTING REQUIREMENTS:

2.1 Cv TEST SHALL BE CARRIED OUT ON THE OFFERED VALVES AS PER ISA 75.02 STANDARD & TEST REPORT SHALL BE SUBMITTED FOR BHEL REVIEW AND APPROVAL OR FURNISH TYPE TEST REPORT (NOT OLDER THAN 5 YEARS) OF THE SAME VALVE AS THE OFFERED VALVE.

2.2 **FOLLOWING TESTS SHALL BE PERFORMED ON VALVE & TEST REPORTS SHALL BE SUBMITTED FOR BHEL REVIEW:-**

2.2.1 SHELL STRENGTH TEST AS PER TEST P10 OF EN12266 PART-1 (LATEST EDITION) OR EQUIVALENT TEST AS PER ANSI / ASME STANDARD.

2.2.2 SHELL TIGHTNESS TEST AS PER TEST P11 OF EN12266 PART-1 (LATEST EDITION) OR EQUIVALENT TEST AS PER ANSI / ASME STANDARD.

2.2.3 SEAT TIGHTNESS TEST AS PER EN60534-4 (LATEST EDITION) OR ANSI FCI 70-2 (LATEST EDITION). ACCEPTANCE CRITERIA LEAKAGE CLASS-IV.

2.2.4 VALVE SHALL BE FUNCTIONALLY TESTED TO CHECK IT'S DESIGN CHARACTERISTICS.

2.2.5 VENDOR TO CLEARLY SPECIFY(AT OFFER STAGE) THE CODES/STANDARDS TO BE USED FOR TESTS MENTIONED AT CLAUSE 2.2.1, 2.2.2, 2.2.3 & 2.2.4 ABOVE.

2.3 NDT (RT & UT) SHALL BE PERFORMED ON VALVE COMPONENTS AS PER ASME B16.34.

3. DOCUMENTS TO BE SUBMITTED BY THE SUPPLIER:

3.1 DOCUMENTS TO BE SUBMITTED ALONGWITH THE OFFER:
(i) DATA SHEET OF VALVE & ACTUATOR.
(ii) SIZING CALCULATIONS OF VALVE & ACTUATOR.
(iii) CROSS-SECTIONAL DRAWING OF VALVE AND PNEUMATIC ACTUATOR ALONGWITH BILL OF MATERIAL.
(iv) VALVE CHARACTERISTIC CURVES.
(v) GENERAL ARRANGEMENT DRAWING OF VALVE ALONG WITH ACTUATOR INDICATING OVERALL DIMENSIONS, REQUIRED MAINTENANCE SPACE, DETAILS OF WELD ENDS, OVERALL ASSEMBLY WEIGHT & DIRECTION OF FLOW.
(vi) HOOK-UP DIAGRAM ALONG WITH IT'S FUNCTIONAL WRITE-UP.
(vii) CATALOGUES OF ALL ACCESSORIES e.g. POSITIONER, VOLUME BOOSTER, AIR LOCK RELAY, AIR FILTER & REGULATOR.
(viii) REQUIRED SUPPLIED AIR PRESSURE, SPRING RANGE, TUBING/CONNECTION SIZE.
(ix) RECOMMENDED QUALITY & QUANTITY OF AIR.
(x) LIST OF COMMISSIONING SPARES.
(xi) PRICED LIST OF RECOMMENDED SPARES AS PER BHEL DRG. NO. 31324000001 . IN ADDITION TO THE SPARE PARTS AS PER BHEL DRG., THE VENDOR SHALL ALSO INCLUDE PRICED LIST OF RECOMMENDED SPARES FOR 5 YEARS OF NORMAL OPERATION OF THE PLANT.

3.2 DOCUMENTS TO BE SUBMITTED IN THE EVENT OF ORDERING:
(i) IN THE EVENT OF ORDERING THE FOLLOWING DOCUMENTS ARE REQUIRED TO BE SUBMITTED WITHIN 4 WEEKS OF PLACEMENT OF PURCHASE ORDER & GOT APPROVED BY BHEL BEFORE START OF ANY MANUFACTURING ACTION.
(a) VALVE & ACTUATOR DATASHEET.
(b) CROSS-SECTIONAL DRAWING OF VALVE AND ACTUATOR ALONGWITH BILL OF MATERIAL.
(c) GENERAL ARRANGEMENT DRAWING OF VALVE ALONG WITH ACTUATOR INDICATING OVERALL DIMENSIONS, REQUIRED MAINTENANCE SPACE, DETAILS OF WELD ENDS, OVERALL ASSEMBLY WEIGHT & DIRECTION OF FLOW.
(d) HOOK-UP DIAGRAM OF VALVE WITH ACTUATOR, POSITIONER, FILTERS & GAUGES ETC.
(ii) 25 HARD COPIES+7 CDs OF O&M MANUAL SHALL BE SUPPLIED BY THE VENDOR. OUT OF THESE, 3 HARD COPIES+ 1 CD SHALL BE SENT TO SITE ALONGWITH THE EQUIPMENT & REMAINING 22 COPIES+6 CDs SHALL BE SENT TO BHEL, HARIDWAR WITHIN 12 WEEKS OF PLACEMENT OF P.O.

4. GENERAL REQUIREMENTS :-

4.1 GUARANTEE: GUARANTEE PERIOD SHALL BE 24 MONTHS FROM THE DATE OF SHIPMENT OR 18 MONTHS FROM THE DATE OF COMMISSIONING, WHICHEVER IS EARLIER. INCASE OF ANY FAILURE OR TROUBLE REPORTED FROM THE SITE, THE SUPPLIER WOULD DEPUTE THEIR REPRESENTATIVE IMMEDIATELY TO ATTEND THE PROBLEM AND REPLACE THE DEFECTIVE COMPONENT/PARTS, IF REQUIRED. 01

4.2 PAINTING:
4.2.1 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 ACCORDING TO ISO 8503-1 SA 2 1/2.
4.2.2 WELDING END SHALL BE 80MM PAINT FREE. VALVE BODY IS TO BE PAINTED WITH ALUMINIUM PAINT AS PER IS:13183 GR.1 WITH PAINT THICKNESS OF MINIMUM 70 MICRONS.
4.2.3 CHECKING OF SURFACE PREPARATION, MEASUREMENT OF DRY PAINT THICKNESS, ADHESION, GLOSS & FINISH OF PAINTED SURFACE IS DONE AS PER ANNEXURE-E FOR PAINTING & COATING OF EQUIPMENT & STRUCTURES (CLAUSE 6.0, INSPECTION & TESTING).
4.2.4 ADDITIONALLY, SUPPLY OF TOUCH-UP PAINT (5 % OF TOTAL FINISH COAT QUANTITY) IS INCLUDED IN VENDOR SCOPE.

4.3 PACKING & DESPATCH:
(I) THE VALVE SHALL BE PACKED AND LOCKED IN SUCH A WAY, THAT IN GENERAL CASE ANY DAMAGE IS PROHIBITTED.
(II) ALL OPENINGS SHALL BE PLUGGED.
(III) AS FAR AS POSSIBLE NECESSARY ACCESSORY DEVICES FOR TRANSPORTATION PURPOSE SHALL BE ATTACHED TO THE VALVE AND/OR TO THE PACKING e.g. LIFTING EYES & LIFTING SIGNS.
(IV) BEARING AREAS SHALL BE MARKED IF NECESSARY.
(V) VALVE SHALL HAVE AN ARROW PERMANENTLY FIXED ON THE VALVE BODY TO INDICATE THE CORRECT DIRECTION OF FLOW.
(VI) VALVE SHALL HAVE A STAINLESS STEEL NAME PLATE PERMANENTLY FASTENED TO THE YOKE WHICH SHALL BE VISIBLE WHEN THE VALVE IS IN SERVICE. THE NAME PLATE SHALL INCLUDE-
(i). TAG NO. AND VALVE SERIAL NO.
(ii). BODY MATERIAL, SIZE AND PRESSURE RATING
(iii). TRIM MATERIAL, SIZE CHARACTERISTICS
(iv). ACTION ON AIR FAILURE
(v). SPRING RANGE
(vi). STEM TRAVEL
(vii). VALVE ACTION, ETC.

4.4 THE SUPPLIER SHALL BEAR FULL RESPONSIBILITY FOR COMPLIANCE OF ALL THE PARTS & COMPONENTS SUPPLIED IN PURSUANT TO THIS SPECIFICATION WITH THE FULL SCOPE OF SAFETY REGULATIONS OF THE COUNTRY.

MAT. CODE : W90313240450

REV	DATE	ALTERED / CHECKED
02	01.03.25	ALTERED H.SINGH –SD– / CHECKED L.P.SINGH –SD–
		CHANGES MADE ONLY IN DRG. SHEET NO.2 AS PER C/R NO. SSTEHS_000305.
01	24.06.24	ALTERED H.SINGH –SD– / CHECKED L.P.SINGH –SD–
		CHANGES MADE ONLY IN DRG. SHEET NO.2 AS PER C/A NO. STE-24-F0145.

GRADE OF UNTOL.DIM
M/CG.–C/M/F AA0230208
WELDING–A/B/C/D AA0621104
GAS CUTTING–'T3'AA0621101

GMS No./ CBOM No.	AGREED DEPT	NAME	SIGN	STATUS OF DRG U DATE
	CIE	MUDIT	–SD–	29.11.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: STEAM TURBINE

BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR

	NAME	SIGN	DATE
DRN	H. SINGH	– sd –	24.11.23
CHD	L.P.SINGH	– sd –	25.11.23
APPD	V.SRIVASTAVA	– sd –	29.11.23

NO. OF VAR –

DEPT STE | CODE 4011 | SCALE N.T.S | WEIGHT (KG) – | REF. TO ASSY. DRG. – | ITEM No. | NO. OF ITEMS –

TITLE: LEAK STEAM CONTROL VALVE WITH PNEU. ACT.

CARD CODE | DRAWING NO. 2-13240-52100 –

SHEET No. 02 | No. OF SHEETS 02

SIZE A2

Ref.Drawing No. 2-13240-11200

Sign & Date

Inventory No

PROJECT: 250 /500/660/700/800 MW PROJECT
DATE: 28.02.2025, REV05
ITEM: SMART POSITIONER FOR SEAL STEAM & LEAK STEAM CONTROL VALVE
ADDENDUM TO DRAWING NO:
APPLICATION: STEAM TURBINE

ADDITIONAL SPECIFICATION:

1.0 **SCOPE:** This specification is intended to cover the requirements of Smart positioner for Pneumatic actuator of control valve.

2.0 **ELECTRICAL:**

2.1 Input signal shall be 4-20 mA from control system with Hart signal super- imposed.
2.2 Power supply: loop powered.
2.3 Valve position sensing to be provided, non-contact type, 4-20 mA for control system.

3.0 ENVIRONEMENT:

3.1 Operating temp shall be 0 to 70 degree C.
3.2 Humidity: 0-95%
3.3 Protection class shall be IP-65 minimum.

4.0. SOFTWARE CONFIGURATION DIAGNOSTIC:

4.1 Windows 2000/NT based software. Software shall meet the requirement for configuration, diagnostics, calibration and testing of the actuator. However, Software package for advanced diagnostic features is not required.

4.2 It shall be SMART and should have advanced diagnostic features like Travel Counter on line partial closure test, valve signature analysis, step response test, valve friction/jamming detection. The Positioner shall be advanced diagnostic compatible.

4.3 Factory valve signature tests reports (PR vs valve travel and Travel vs IP signal shall be provided.

5.0 CONFIGURATION/OPERATING MODES:

5.1 Calibration: Remote calibration, auto & manual calibration shall be possible.

5.2 Operating range: Full range & split range signal range.

5.3 Valve action: Direct & reverse valve action.

5.4 Flow characterization possible to fit valve linear, equal percentage.

6.0 FAIL SAFE

6.1 In case control signal 4 – 20 mA DC fails, (Pneumatic supply in OK condition, the valve will move to the default Fail safe position (Fail Close --- for Leak as well as seal steam valves).
In case Pneumatic signal fails, control signal (4 – 20 mA DC) in OK condition, then Air inside the Actuator will be Locked by Air Lock Relay, thus Fail Lock condition will be achieved i.e. Last Position hold prior to Failure of Air supply.

7.0 PERFORMANCE:

7.1 Characteristic deviation shall be <=0.5% of SPAN.

7.2 Ambient temp. effect shall be <=0.01% Deg. C or better.

8.0 ACCESSORIES:

8.1 In built operator panel display with push buttons for configuration and display on the positioner itself (password/hardware Lock).

8.2 Air filter regulator to be provided.

8.3 Press Gauge Block for supply & output pressure, filter regulator other accessories shall be provided as on required basis for making system complete.

8.4 Junction Box to be provided. Junction Box Specification -18 Ways, ½'' NPT 3 Nos. Cable entry. Weather Proof IP 65 Min.

8.5 Cable glands to be provided. Cable gland specification-Double Compression SS 304(Weather Proof IP 65)

8.6 Position transmitter whether integral part of positioner or not: To be specified by vendor.

9.0 DOCUMENTS TO BE PROVIDED:

9.1 Datasheet including positioner model and make, Hook –up diagram to be complete input/output signals duly terminated onto JB.

10.0 PACKING:

10.1 The positioner shall be loosely supplied in the main package with proper identification along with all fittings for mounting on the main valve and cables for termination to the Junction Box.

10.2 The Packing should be seaworthy (with silica gel) to avoid ingress of Moisture.

10.3 The positioner shall be packed in separate wooden box/compartment to avoid breakage.

10.4 Proper Labeling such as item name “Positioner”, “P.O.” etc. shall be clearly indicated on the wooden Box for identification in case of misplacement.

10.5 Two sets of Mounting and Calibration Instruction manual shall be sent along with the positioner.

10.6 O&M manual for mounting and calibration of positioner shall be submitted along with the offer.

Prepared:	Checked:	Approved:
(Mudit Jain) Sd/-	(Saswati) Sd./-	(Vinod Kumar) Sd./-
(CIE)	(CIE)	(CIE)

FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm) | FORM: DG-38(B)

DRAWING NO. 3-13240-52110

SPARES APPLICABLE FOR LEAK OFF STEAM VALVE WITH PNEUMATIC ACTUATOR

SL. NO.	CUSTOMER SPECIFICATION CLAUSE NO.	DESCRIPTION	QUANTITY
01	3.06.1	VALVE TRIM (INCLUDING CAGE, PLUG, STEM, SEAT RINGS, GUIDE BUSHING ETC.) FOR LEAK STEAM CONTROL VALVE	1 SETS
02	3.06.2	PNEUMATIC ACTUATOR FOR LEAK STEAM CONTROL VALVE – COMPLETE ASSEMBLY	1 NO.
03	3.06.3	O-RINGS AND SEALS FOR LEAK STEAM CONTROL VALVE	1 SET
		O-RINGS AND SEALS FOR LEAK STEAM CONTROL VALVE ACTUATOR	1 SET
		DIAPHRAGM/PISTON FOR LEAK STEAM CONTROL VALVE ACTUATOR	1 NO.
04	3.06.4	AIR FILTER REGULATOR FOR LEAK STEAM CONTRL VALVE ACTUATOR	1 NO.
05	3.09.–E.1.1	DIAPHRAGM/PISTON FOR PNEUMATIC ACTUATOR OF LEAK STEAM CONTROL	2 NOs.
06	3.09.–E.1.3	GLAND PACKING FOR LEAK STEAM CONTROL VALVE	1 SET
07	3.09.–E.1.4	PLUG, SEAT, CAGE, STEM ETC. FOR LEAK STEAM CONTROL VALVE	1 SET
08	3.09.–E.1.5	RETAINER RING, SEAL RING ETC. FOR LEAK STEAM CONTROL VALVE	1 SET
09	3.09.–E.1.6	GASKET FOR LEAK STEAM CONTROL VALVE	2 SETS
10	3.09.–E.2.1	SEAL KIT FOR PNEUMATIC ACTUATOR OF LEAK STEAM CONTROL VALVE	2 SETS
11	3.09.–E.2.2	GASKETS FOR PNEUMATIC ACTUATOR LEAK STEAM CONTROL VALVE	2 SETS
12	3.09.–E.2.3	PNEUMATIC ACTUATOR FOR LEAK STEAM CONTROL VALVE (COMPLETE ASSEMBLY)	1 NO.
13	3.09.–E.3.6	AIR LOCK RELAY FOR LEAK STEAM CONTROL VALVE	10 NOS. FOR EACH TYPE
14	3.09.–E.3.7	VOLUME BOOSTER UNIT FOR LEAK STEAM CONTROL VALVE	2 NOS. FOR EACH TYPE

NOTES: –

1. ALL THE MANDATORY SPARES SPECIFIED ABOVE SHALL BE MANUFACTURED EXACTLY SAME AS AGAINST MAIN SUPPLY.
2. AGAINST ITEM AT SERIAL NO.12 OF ABOVE TABLE PNEUMATIC ACTUATOR WITHOUT ACCESSORIES IS REQUIRED.
3. INTERCHANGEABILITY OF THE MENTIONED ITEMS ARE FOR REPLACEMENT WITH THEIR PARTS FOR WHICH SUPPLY IS TO BE MADE AGAINST MAIN OFFER.
4. ALL THE SPARES MUST BE PACKED IN SEALED TRANSPARENT PLASTIC BAGS AND CLEARLY MARKED OR LABELLED ON THE OUTSIDE OF THE PACKING WITH ITS DESCRIPTION & ASSEMBLY PART NUMBERS.
5. QUALITY CHECKS & TESTING NORMS/REQUIREMENTS AS PER AGREED QUALITY PLAN (QP) SHALL ALSO BE APPLICABLE FOR ALL THE SPARES AS LISTED.
6. IF ANY ITEM IS NOT APPLICABLE THAN EQUIVALENT ITEM TO BE SUPPLED BY THE VENDOR.
7. ALL MANDATORY SPARES ARE TO BE PACKED IN GREEN COLOUR BOX WITH " MANDATORY SPARES FOR LEAK OFF STEAM VALVE" LABELED ON IT.

MAT. CODE: W99313240599

REF. DRG NO. ------ | SIGN & DATE | INVENTORY NO.

CBOM NO. --			STATUS OF DRG.
AGREED DEPT.	NAME	SIGN	DATE
--	--	— —	— —

GRADE OF UNTOL. DIM.:–
M/CG– V/C/M/F AA 0230208
WELDING–A/B/C/D–AA0621104
GAS CUTTING–'T3'AA0621101

REV.	DATE	ALTERED / CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: STEAM TURBINE

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	LOKESH	–SD–	07.10.23	–
CHD	L.P.SINGH	–SD–	07.10.23	
APD	V.SRIVASTAVA	–SD–	— —	73, 74

DEPT. STE	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
CODE 4011	— —	– –	—— —— —— ——	--	– (75, 77)

TITLE: SPARES FOR LEAK OFF STEAM VALVE

1 - 3

DRAWING NO. 3–13240–52110 – (7 … 22, 23, 24)

SHEET NO. 02 | NO.OF SHEETS 02

SIZE A3

FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm) | FORM DG 38(B)

DRAWING NO. 3-13240-00001

TABLE-1 SPARES FOR LEAK OFF STEAM VALVE

S.NO.	ITEM DESCRIPTION	QTY.
01	COMPLETE SET OF INTERNALS (EXCEPT OUTER BODY& BONNET ALONG WITH ACTUATOR)	1 SET
02	GUIDE BUSHINGS	1 SET
03	PLUG AND STEM ASSEMBLY	1 SET
04	CAGE	1 NO
05	SET OF O RINGS	1 SET
06	SEALING RINGS	1 SET
07	SET OF GASKETS	1 SET
09	BONNET SEAL	1 SET
10	SET OF PACKING	1 SET
11	SEAT RING	1 NO
12	GLAND PACKING	1 SET
13	RETAINER RING	1 NO

TABLE-2 SPARES FOR LEAK OFF STEAM VALVE ACTUATOR

S.NO.	ITEM DESCRIPTION	QTY.
01	COMPLETE ACTUATOR ASSEMBLY ALONG WITH ACCESSORIES	1 SET
02	POSITIONER ALONG WITH POSITION TRANSMITTER	1 NO
03	ACTUATOR DIAPHRAGM	1 NO
04	ACTUATOR STEM	1 NO
05	SEALS/GASKETS	1 SET
06	O RINGS	1 SET
07	AIR LOCK RELAY	1 NO
08	VOLUME BOOSTER	1 NO
09	AIR FILTER & RELIEF VALVE	1 NO
10	AIR SET	1 NO
11	PILOT RELAY	1 NO

TECHNICAL REQUIREMENTS :-

1. INTERCHANGEABILITY OF THE MENTIONED ITEMS ARE FOR REPLACEMENT WITH THEIR PARTS FOR WHICH SUPPLY IS TO BE MADE AGAINST MAIN OFFER
2. ALL THE SPARES MUST BE PACKED IN SEALED TRANSPARENT PLASTIC BAGS AND CLEARLY MARKED OR LABELLED ON THE OUTSIDE OF THE PACKING WITH ITS DESCRIPTION & ASSEMBLY PART NUMBERS.
3. QUALITY CHECKS & TESTING NORMS/REQUIREMENTS AS PER AGREED QUALITY PLAN (QP) SHALL ALSO BE APPLICABLE FOR ALL THE SPARES AS LISTED.
4. ALL THE RELEVENT ASSEMBLY DRGS. SHALL BE FURNISHED BY THE VENDOR MARKING ALL THE OFFERED ITEMS.

21323913000 Ref.Drawing No.

Sign & Date

Inventory No.

GRADE OF UNTOL. DIM
M/CG.- ~~AA0230208 m~~
WELDING-~~CLASS 'B' OF AA0621104~~
GAS CUTTING-~~TABLE 3 OF AA0621101~~

REV	DATE	ALTERED / CHECKED

REV	DATE	ALTERED / CHECKED

REV	DATE		
01	27.02.16	ALTERED H.SINGH	-SD-
		CHECKED ADRASH	-SD-

CHANGES HAVE BEEN INCORPORATE AS PER C/A NO.-STE-16-F0058.

~~GMS No./~~ C B O M

AGREED DEPT	NAME	SIGN	DATE
CIE	SASWATI	-SD-	03.01.16

STATUS OF DRG: U

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: STEAM TURBINE

BHARAT HEAVY ELECTRICALS LTD.
RANIPUR, HARDWAR

	NAME	SIGN	DATE
DRN	HARENDRA	SD/-	01.01.16
CHD	AKS/NN	SD/-	02.01.16
APPD	P.K.BANSAL	SD/-	03.01.16

NO. OF VAR: -

DEPT STE
CODE 4011

SCALE NTS

WEIGHT (KG) —

REF. TO ASSY. DRG.

ITEM No. —

NO. OF ITEMS —

TITLE : 01 OPTIONAL SPARES - LEAK OFF STEAM VALVE

CARD CODE

DRAWING NO. 3-13240-00001 —

SHEET No. 1 | No. OF SHEETS 1

SIZE A3

PROJECT INFORMATION - SITE DESIGN DATA – APL-KAWAI, PHASE-II

1. Project Information - Site Specific Design Details:

Project	Adani Power Rajasthan Limited (APRL), 2x800 MW Phase-II & 2x800 MW Phase-III Ultra Supercritical Thermal Power Projects
Existing Unit	2x660 MW Supercritical Thermal Power Plant
Site Location	Village - Kawai, Tehsil - Atru, Baran - District in Rajasthan
Eastern Longitude	76°43' 52" E
Northern Latitude	24°46' 40" N
Nearest Railway Station	Salpura at 0.2 km, Kota - Bina Line
Nearest Villages	Kawai
Nearest Town	Baran - 30 km
Nearest City	Kota at a distance of 130 Km
Nearest Port	Mundra
Nearest Airport	Kota at a distance of 120 km & Jaipur at 370 km
Access Road	NH-90 Near Site
Altitude	308.5 m above MSL
Seismic Data:	
(a) Seismic intensity	As per IS 1893, Part 1 & 4
(b) Zone	Zone-II as per IS 1893 latest edition
(c) Importance factor	1.75 as per IS: 1893-part IV latest edition
Wind Data:	
Basic wind speed	47 m/s as per IS 875 (Part-III) - latest edition K1 Factor – 1.07, K2 Factor – Shall be as per IS-875 Part III latest edition based on the height of the structure for Terrain Category 2 K3 Factor – 1, K4 Factor – 1
Wind Direction	Predominantly South-East
Ambient Air Temperature:	
(a) Dry bulb	27°C (Guarantee)
(b) Annual Mean Dry bulb	33.3°C
(c) Maximum Dry bulb	48.5°C
(d) Minimum Dry bulb	1.7°C
(e) Maximum Dry bulb (Design)	50°C
Relative Humidity:	
(a) Average	60% (Guarantee)
(b) Max. (Mean value of Summer month)	90%

(c) Min. (Mean value of Summer month)	18%
Rain Fall:	
Average Annual rain fall	761.4 mm
Auxiliary power supply:	
Power Evacuation	400 kV (±5%), 3 phase, 3 wire 50 Hz, effectively earthed.
Generation Voltage	27kV, 3 phase,50 Hz, NGTR earthed
Plant HT Auxiliary Supply	11kV (±10%) & 6.6k V (±10%), 3-phase, 3W, 50 Hz, earthed through resistance.
Plant LT Auxiliary Supply	415V (±10%), 3 phase, 4 wire, solidly earthed.
Plant LT Emergency Supply	415V (±10%), 3 phase, 4 wire ungrounded.
Plant DC Supply	220V (+10% to -15%), DC 2 wire unearthed.
Plant UPS Supply	230V (±10%), 1 phase, 2 wires 50 Hz, A.C.
Panel lighting and space heaters	240V, 1-phase, 2wires 50 Hz, A.C. with one point earthed.
Metering, control & protection	220V DC control supply for Protection, Control Supply for Breaker feeders & Numerical relay. 110V AC supply for contactor-controlled feeder in LT Switchgear.
For motors rated above 2000 kW	11KV, 3 phase, 3 wire, 50 Hz earthed through resistance
For motors rated above 200kW & up to 2000kW	6.6kV, 3 phase, 3 wire, 50Hz earthed through resistance
For motors rated above 0.2kW up to 200 kW	415V AC, 3-phase, 4-wire, 50 Hz effectively earthed
For motors rated up to 0.2 kW	240V, 1 phase, 50 Hz, effectively earthed.
DC motor starters, DC solenoids, DC alarm	220V DC, 2 wire, unearthed DC
Frequency	50 Hz (+3% to -5%)
Fault Level	For 400KV- 63 kA (1 Sec.) For 11kV – 50kA (1 sec) For 6.6kV- 50 kA (1 Sec.) For 415V- 50 kA (1 Sec.) For 220V- 25 kA (1 Sec.)
Design Ambient Temperature of electrical equipment	50^0 C
Relative Humidity for design of Electrical equipment	90%

VOL II

TECHNICAL SPECIFICATION

SECTION 6

SITE CONDITIONS

6.0 SITE CONDITIONS

6.1.0 Location and Infrastructure

2 x 800 MW coal based Ultra Super Critical Thermal Power Station (USCTPP) is being set up by **Adani Power Ltd.** at Bandhaura village, Singrauli District, Madhya Pradesh, India.

The site is well connected by the National / State Highways; State Highway (SH-14) is passing about 16 km from the site.

Bandhaura is well connected with Road as well as Rail network from all the major towns Waidhan and Singrauli in Madhya Pradesh

The Nearest Airport is at Varanasi at a distance of 280 km from the project site. The nearest railway station Singrauli station is located at 52 km from project site. The nearest seaport is at Dhamra at a distance of 770 km from project site.

6.2.0 Basic Plant Data

GEOLOGICAL CONDITIONS

Soil Data

Layer 1 - At project site sandy Clay soil strata is available having N values 8 to 16; average soil layer thickness 5m.

Layer 2 – Browning stiff Clay having N value 19 to 24; having soil layer thickness 5 to 10m.

Layer 3 – Poorly graded sand having N value 10 to 43; strata thickness from 10 to 15m.

Layer 4 – compacted sand having N value > 100; layer thickness 15 to 18m,

Subsequently sandy stone encounters.

Seismic Zone IV

Seismic intensity

Seismic Intensity:	As per IS: 1893
Zone:	IV
Importance Factor:	1.75
Zone Factor:	(Moderate)

METEOROLOGICAL CONDITIONS

Ambient Air Temperature

Highest monthly mean of daily maximum temperature: 42 °C

Highest monthly mean of daily minimum temperature Min. 3.3 °C

Highest ambient temperature: 48.8 °C

Lowest ambient temperature: 1 °C

Relative Humidity

Maximum Humidity: 85%

Minimum Humidity: 20%

Average relative humidity: 66% during morning hours and 49% during evening hour

Rainfall

The annual average rain fall: 1132.7 mm.

Wind

Basic wind Speed experienced: 47 m/s as per IS 875 part 3:1987

Wind loads to be considered for design of structures shall be based on the design wind speeds arrived at. Based on IS: 875 (Part -3) or the actual observed wind speeds furnished above, whichever is more critical. The parameters for calculation of design wind speed as per IS: 875 (Part -3) -1987 are as follows:

Basic wind speed	47 /sec
Risk coefficient (K1 factor):	1.07 for plant structures
	1.00 For non-plant structures
Terrain category (K2 factor):	Category 1
Topography factor (K3 factor):	1.0

PROJECT INFORMATION - SITE DESIGN DATA – MIRZAPUR

1. Project Information - Site Specific Design Details:

Project	2x800 MW Ultra Super-Critical Thermal Power Project
Site Location	Village – Dadri Khurd, Taluka – Mirzapur Sadar, Dist. – Mirzapur, Uttar Pradesh.
Eastern Longitude	82039'50.425" E to 82041'03.72" E
Northern Latitude	24058'41.645" N to 25000'16.88" N
Nearest Railway Station	Lusa Railway Station (on Mirzapur-Singrauli Line), approx. 24 km from Site.
Nearest City	Mirzapur, approx. 25 km by SH-5
Nearest Sea Port (By Rail Route)	Haldia Port, approx. 813 km from Site Distance from Dhamra Port is 870 km
Nearest Airport	Varanasi Airport, approx. 95 km from Site
Access Road	SH – 5, approx. 1.7 km from Site (on Mirzapur – Robertsganj section) NH-7, approx. 23 km (on Mirzapur - Chunar Section)
Altitude	180 m above MSL
Seismic Data:	
(a) Seismic intensity	As per IS 1893, Part 1 & 4
(b) Zone	Zone-III as per IS 1893 latest edition
(c) Importance factor	1.5 as per IS: 1893-part IV latest edition
Wind Data:	
Basic wind speed	47 m/s as per IS 875 (Part-III) - latest edition
Wind Direction	Southwest to Northeast
Ambient Air Temperature:	
(a) Dry bulb	27°C (Guarantee)
(b) Annual Mean Dry bulb	29°C
(c) Average Minimum Dry bulb	12°C
(d) Average Maximum Dry bulb	42°C
(e) Highest Ambient Dry bulb	48.8°C
Relative Humidity:	
(a) Average	60% (Guarantee)
(b) Max.	88%
(c) Min.	28%
Auxiliary power supply:	
Power Evacuation	400 kV (±5%), 3 phase, 3 wire 50 Hz, effectively earthed.
Generation Voltage	27kV, 3 phase,50 Hz, NGTR earthed

Plant HT Auxiliary Supply	11kV (±10%) & 6.6k V (±10%), 3-phase, 3W, 50 Hz, earthed through resistance.
Plant LT Auxiliary Supply	415V (±10%), 3 phase, 4 wire, solidly earthed.
Plant LT Emergency Supply	415V (±10%), 3 phase, 4 wire ungrounded.
Plant DC Supply	220V (+10% to -15%), DC 2 wire unearthed.
Plant UPS Supply	230V (±10%), 1 phase, 2 wires 50 Hz, A.C.
Panel lighting and space heaters	240V, 1-phase, 2wires 50 Hz, A.C. with one point earthed.
Metering, control & protection	220V DC control supply for Protection, Control Supply for Breaker feeders & Numerical relay. 110V AC supply for contactor-controlled feeder in LT Switchgear.
For motors rated above 2000 kW	11KV, 3 phase, 3 wire, 50 Hz earthed through resistance
For motors rated above 200kW & up to 2000kW	6.6kV, 3 phase, 3 wire, 50Hz earthed through resistance
For motors rated above 0.2kW up to 200 kW	415V AC, 3-phase, 4-wire, 50 Hz effectively earthed
For motors rated up to 0.2 kW	240V, 1 phase, 50 Hz, effectively earthed.
DC motor starters, DC solenoids, DC alarm	220V DC, 2 wire, unearthed DC
Frequency	50 Hz (+3% to -5%)
Fault Level	For 400KV- 63 kA (1 Sec.) For 11kV – 50kA (1 sec) For 6.6kV- 50 kA (1 Sec.) For 415V- 50 kA (1 Sec.) For 220V- 25 kA (1 Sec.)
Design Ambient Temperature of electrical equipment	50^{0}C
Relative Humidity for design of Electrical equipment	90%

ANNEXURE-F_ RAIPUR(PH-II)TPP

REL & REGL - Site specific design inputs				
S.No.	**Parameters**	**Unit**	**REL- Raipur 2x800 MW**	**REGL-Raigarh 2x800 MW**
1.	**Ambient Temperature (Guarantee of SG)**	°C	27	27
	Ambient Temperature (Design of SG)		Refer attached file	Refer attached file
2.	**Relative Humidity (Guarantee of SG)**	%	60	60
	Relative Humidity (Design of SG)		Refer attached file	Refer attached file
3.	**Height above MSL**	m	300	215
4.	**Seismic Zone**		Zone-II as per IS 1893 and Importance factor 1.75 as per IS: 1893 part IV latest edition	Zone-II as per IS 1893 and Importance factor 1.75 as per IS: 1893 part IV latest edition
5.	**Wind Data**			
5a.	Basic Wind Speed, Vb	m/s	44 m/s as per IS 875 (Part-III) latest edition	39 m/s as per IS 875 (Part-III) - latest edition
5b.	K1 Factor		1.07	1.07
5c.	K2 Factor		Shall be as per IS-875 Part III latest edition based on the height of the structure for Terrain Category 2	Shall be as per IS-875 Part III latest edition based on the height of the structure for Terrain Category 2
5d.	K3 Factor		1	1
5e.	K4 Factor		1	1

ANNEXURE-B

Check –List for Leak off steam valve (Material code: W90313240450), Drawing. No. 21324052100, Rev. 00

SL No.	BHEL SPECIFICATION REQUIREMENT	Vendor's confirmation/ Remark	Vendor's document no.
1	**Valve body material:** ASTM A217 Gr. C12A		
2	**Counter Flange material:** ASTM A182 Gr. F91		
3	**Valve Class:** 300.		
4	**Valve Characteristics:** Equal %		
5	**Counter flange End connection details:** i. Inlet : 457.2 X 9.53, Butt welded as per fig.4 of ASME B16.25 ii. Outlet : 457.2 X 9.53, Butt welded as per fig.4 of ASME B16.25		
6	**Controllable range of Cv**		
7	**Hand wheel for manual operation shall be provided.**		
8	**Manual vent valve shall be provided.**		
9	**Following commissioning spares shall be provided:** **i.Packing & gaskets 1 set.** **ii. washers for flange: 1 complete set for each flange connection.**		
10	**Valve shall be IBR approved.**		
11	**Testing of valve as per cl. no. 2.2 of BHEL specification.**		
12	**Paint as per cl. no. 4.2 of BHEL specification or equivalent**		
13	**End connection in actuator for air supply:** 3/4" pipe connector (CS, weldable) to be supplied by the vendor		
14	**Failure mode: stay put**		
15	**Cv test report submission after placement of P.O.**		
16	**Operating time < 3 sec**		
17	**Weight of complete assembly of valve along with actuator <2000 Kg**		
18	**Valve leakage class-V as per ANSI FCI 70-2**		
19	**Function of Actuator:** Air to open spring to close		
20	**Type of actuator: Spring diaphragm**		
21	**Recommended quality and quantity of air**		
22	**Required supply air pressure (Max/Min- 10/5 bar g)**		
23	**Documents submission for BHEL approval within 4 weeks after placement of P.O. as per cl. no. 3.2 of BHEL specification.**		
24	**O & M Manual:** Submission of 25 Hard copies (3 copies along with equipment to the site & remaining 22 to BHEL, Hardwar within 12 weeks of placement of P.O.).		

ANNEXURE-C

Leak off steam control valve - Check List for Documents/Information to be furnished along withthe offer

SL. No.	Document/Information details	Vendor's confirmation/ Remark	Vendor's document no.
1	Data sheet of valve and actuator		
2	Sizing calculation of valve and actuator		
3	General arrangement drawing of valve along with actuator indicating: i. Cross-sectional drg. of valve and pneumatic actuator alongwith BOM. ii. overall dimensions, iii. required maintenance space, iv. details of weld ends, v. overall assembly weight vi. direction of flow		
4	Valve characteristic curve.		
5	List of commissiong spares.		
6	Hook up diagram along with its functional write up		
7	Detailed catalogue mentioning type of position transmitter position controller, volume booster, air lock relay, air filter and regulator		
8	Priced list of optional spare parts as per applicable BHEL drg. No.31324000001 for future ordering		

non-return valves mounted on vertical pipe, integral bypass shall be used to facilitate draining

Control Valves

Control valves shall be used for HP & IP type depending upon the pressure & temperature rating as classified. The control valve sizing shall be suitable for obtaining rated flow conditions with valve opening at approximately 60 to 70% of total valve stem travel and minimum flow conditions with valve stem travel not less than 10% of total valve stem travel. All the valves shall be capable of handling at least 120% of the required rated flow. Further, the valve stem travel range from minimum flow condition to rated flow condition shall not be less than 50% of the total valve stem travel. The sizing shall be in accordance with the latest edition of ISA on control valves. The valves port outlet velocity shall not exceed 8 m/sec for liquid services, 150 m/sec for steam services and 50% of sonic velocity for flashing services.

Valve body rating shall meet the process pressure and temperature requirement as per ANSI B16.34. All control valves shall have leakage rate as per leakage Class-IV. For cavitation services, valves with anti-cavitation trim shall be provided. Applications like CEP minimum recirculation valve shall have anti-cavitation trim with tight shut-off. The deaerator level control valve shall have characterized trim cages to have a cavitation protection at minimum flow as well as good range ability.

S.No.	Service	Application	Trim material
1	Non-corrosive, non-flashing and non-cavitation service below 275 ^{O}C	Auxiliary steam flow to Deaerator, Condensate flow to Deaerator, CRH flow to Deaerator	ASME B 16.34 & SS 304
2	Severe flashing/ cavitation services	HP heaters & LP heaters emergency drain, Deaerator overflow drain to hotwell etc.	ASME B 16.34 & Stellite / Hastelloy C
3	Low flashing/ cavitation service	HP heater/ LP heater normal drains level control, GSC minimum flow, gland seal steam pressure control valve etc.	ASME B 16.34 & Stellite / Hastelloy B
4	Condensate service below 300 ^{O}C	Condensate normal and emergency make-up control, ECW DP control	ASME B 16.34 & SS 316

XXXIII. Noise level

In case the noise level pertaining to equipment covered under the scope exceeds the specified values, as given in relevant clause of General Technical requirement portion of Technical Specification, suitable acoustic enclosures along with all accessories in order to complete the system shall be provided to achieve the specified values. The acoustic enclosures & accessories shall be designed as per internationally accepted standards and shall be subject to Owner's approval. Maximum 85 dB(A) from 1 m away from the equipment.

Acoustic enclosure

XXXIV. INSULATION, CLADDING & PAINTING

	Transducer
Accuracy	+/- 1%
Electrical connection	Plug and socket
Accessories	All mounting hardware required like clamping fixtures, mechanism to remove the transducers online, interconnecting Cables etc. All weather canopy for protection from direct Sunlight and direct rain. Material of all fittings shall be SS316.

6.1.17 Electro Magnetic Flow-Meter

The electromagnetic flow meter shall include flow sensor and flow indicator cum integrator / totalizer and shall include all required accessories for satisfactory operation. The flow meter shall be based on full bore electromagnetic principle and shall be electronic type of proven design, make and model acceptable to the owner.

The flow meter shall meet or exceed the following requirement:

(a) Output: 4-20 mA DC Isolated output
(b) Accuracy: ± 0.5% of calibrated span or better
(c) Repeatability: ± 0.2% of calibrated span or better
(d) Power Supply: 240V AC ± 10%, 50 HZ ± 5%/ 24 V DC.
(f) Protection class: IP-67
(e) Flow tube SS304
(f) Liner Hard Rubber

The flow meter shall provide local indication for instantaneous flow. It should also be possible to get local display for daily and monthly discharge. The flow meter shall indicate totalizer/ integrator to get the daily and monthly discharge as stated above.

6.2 CONTROL VALVES, ACTUATORS & ACCESSORIES

General Technical Guidelines for the Control Valves shall be as follows:

a) Bidder shall exercise extreme caution in selecting severe service control valves like BFP recirculation valves, HP & LP bypass valves, superheater & reheater attemperator valves, PRDS valves for Boiler & Turbine, Soot blower steam pressure control valve, control valves whose downstream are connected to condenser and in vacuum such as HP/LP heater emergency level control, GSC minimum flow, gland sealing control, condensate spill to condensate storage tank, Deaerator drain to condenser Hotwell, condenser make up water control valve and CEP minimum flow control valve. For such critical applications, Bidder shall offer valves which are proven for similar application for not less than 2 years of continuous service in power plant environment. All the above valves shall have leakage class equal or better than class-V with metal-to-metal seating. These valves shall be of multi-stage, multi-path trim design to eliminate vibration, erosion, and noise effects. All other control valves shall not be inferior to leakage class IV.

b) Wherever, steam conditioning calls for Pressure reducing & desuperheating as well, combined PRDS type valves shall be offered.

c) Bidder shall provide redundant control valves for Main condensate flow control, Superheat attemperation control and Reheat attemperation control as a minimum. For other application, if the availability criteria for the plant cannot be met even with the best established product, redundant control valves shall be provided.

d) All control valves shall be located near floor or platform for ease of access with adequate clearances for maintenance and lay-down and shall be placed as station with upstream motorized isolating valve, down-stream isolating valve, inching duty motorized bypass valve and manual drain valves as per P&ID. Each redundant control valve shall have its upstream and downstream motorized isolating valves.

e) For detail technical specification of control valve, kindly refer Mechanical section.

6.2.1 Valve Actuators

Spring diaphragm type actuators shall generally be used. Piston type actuators shall be offered in case of high shut-off pressure & quick response requirement. Bidder shall provide piston type actuators for the following services as a minimum requirement.

a) Auxiliary Pressure reducing & De-super heating stations (excluding spray valves if spray is considered from condensate discharge).
b) Superheat and Reheat Spray Control Valves.
c) Main condensate flow control valve.

The actuator shall be designed for 150% thrust required for the valve (at shut-off pressure) at an airline supply pressure of 5.5 Kg/Sq. cm.

All the actuators shall be supplied mounted on the valve with all the accessories integrally mounted. Diaphragms shall be designed for 200% maximum operating pressure.

Nylon reinforced neoprene shall be used as diaphragm material.

Valve actuators shall be capable of operating at 80 Deg. C ambient, continuously.

Entire actuator assembly shall be painted with corrosion inhibiting paint.

Air connection size shall be 1/4" NPT (F) unless otherwise dictated by process response time. Integral tubing shall be of stainless steel construction.

Bidder shall indicate the stroking time of the valve assemblies with positioner.

All actuators shall be of failsafe design signifying that the spring direction will tend to move the valve (open or close) in a direction safe for the process. “Failure to Open” or “Failure to Close” shall be marked on the actuator.

6.2.2 Valve Positioners

All regulating service valves shall be offered with HART protocol based Smart Electro Pneumatic Positioners to ensure accuracy and repeatability of response. Positioners shall have integral non-contact type position transmitter, input and output gauges, local keypad & display and 4-20 mA DC output for position indication in CCR. Positioners shall be capable of functioning under hot, humid and vibrating conditions. Positioner casings shall be dust tight, corrosion resistant and weatherproof.

In general, positioner shall operate at signal range 4 – 20 mA DC for the full travel of the valve. Split range operation in few cases may be required. Remote calibration from control room shall be possible through HART management station.

6.2.3 Valve Accessories

The accessories of the valves shall include side mounted hand wheels, limit switches, junction boxes, airlock relays etc.. Solenoid valve wherever required shall be furnished.

ANNEXURE-E

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.

ANNEXURE D

BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of Bharat Heavy Electricals Limited (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____[1] through its Unit at……..(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) with its registered office at_____[2] hereinafter referred to as the ' Vendor / Contractor / Supplier ', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No……dated ……[3] valued at Rs……[4] (Rupees ----------)/FC……(in words……..) for ……[5] (hereinafter called the 'Contract') and the Vendor / Contractor / Supplier having agreed to provide a Contract Performance Bank Guarantee, equivalent to ……% (…. Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

we, ……, (hereinafter referred to as the Bank), having registered/Head office at …….. and inter alia a branch at …… being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer any sum or sums upto a maximum amount of Rs ----------[6] (Rupees ----------) without any demur, immediately on first demand from the Employer and without any reservation, protest, and recourse and without the Employer needing to prove or demonstrate reasons for its such demand.

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Vendor / Contractor / Supplier in any suit or proceeding pending before any Court or Tribunal, Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the Vendor / Contractor / Supplier shall have no claim against us for making such payment.

We the ……bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract/satisfactory completion of the performance guarantee period as per the terms of the Contract and that it shall continue to be enforceable till

all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

We ……..BANK further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Vendor / Contractor / Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Vendor / Contractor / Supplier and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Vendor / Contractor / Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Vendor / Contractor / Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Vendor / Contractor / Supplier and notwithstanding any security or other guarantee that the Employer may have in relation to the Vendor / Contractor / Supplier 's liabilities.

This Guarantee shall remain in force upto and including…….. [7] and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Vendor / Contractor / Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the ……..[8]we shall be discharged from all liabilities under this guarantee thereafter.

We, …… BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

a) The liability of the Bank under this Guarantee shall not exceed…… [6]
b) This Guarantee shall be valid up to ……[7]
c) Unless the Bank is served a written claim or demand on or before _____[8] all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of
(Name of the Bank)

Dated…….

Place of Issue…….

Annexure-1

INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for _____

_____
_____ (hereinafter referred to as "Contract"). The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint panel of Independent External Monitor(s) (IEMs), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles: -

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder(s)/ Contractor(s)

2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commits himself to observe the following principles during participation in the tender process and during the contract execution.

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. 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.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and shall await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process , terminate the contract, if already awarded, exclude from future business dealings and/ or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 - **Compensation for Damages**

4.1 If the Principal has disqualified the Bidder (s) from the tender process before award / order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.

4.2 If the Principal is entitled to terminate the Contract according to Section 3, or terminates the Contract in application of Section 3 above , the Bidder(s)/ Cotractor (s) transgression through a violation of Section 2 above shall be construed breach of contract and the Principal shall be entitled to demand and recover from the Contractor an amount equal to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee , whichever is higher, as damages, in addition to and without prejudice to its right to demand and recover compensation for any other loss or damages specified elsewhere in the contract.

Section 5 - Previous Transgression

5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 6 - Equal treatment of all Bidder (s)/ Contractor (s) / Sub-contractor (s)

6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.

6.2 In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor(s) and ensure that all Sub-contractors also sign the Integrity Pact.

6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 -Independent External Monitor(s)

8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.

8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.

8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.

8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.

8.5 The advisory role of IEMs is envisaged as that of a friend, philosopher and guide. The advice of IEMs would not be legally binding and it is restricted to resolving issues raised by a Bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some Bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.

8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process or during execution of Contract, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.

8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to the CMD, BHEL at the earliest. They may also send their report directly to the CVO, in case of suspicion of serious irregularities requiring legal/ administrative action. Only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Commission. IEMs will tender their advice on the complaints within 30 days.

8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions.

8.9 IEMs should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Prinicpal should be looked into by the CVO of the Principal.

8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code / Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs. Issues like warranty/ guarantee etc. shall be outside the purview of IEMs.

8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.

8.13 The word `Monitor' would include both singular and plural.

Section 9 - Pact Duration

9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties till the final completion of contract for successful Bidder, and for all other Bidders 6 months after the Contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.

9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 - Other Provisions

10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.

10.2 Changes and supplements as well as termination notices need to be made in writing.

10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.

10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.

10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract. The fees/expenses on dispute resolution through mediation shall be shared by both the parties. Further, the mediation proceedings shall be confidential in nature and the parties shall keep confidential all matters relating to the mediation proceedings including any settlement agreement arrived at between the parties as outcome of mediation. Any views expressed, suggestions, admissions or proposals etc. made by either party in the course of mediation shall not be relied upon or introduced as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the dispute that is the subject of mediation proceedings. Neither of the parties shall present IEMs as witness in any Alternative Dispute Resolution or judicial proceedings in respect of the dispute that was subject of mediation.

For & On behalf of the Principal
(Office Seal)

For & On behalf of the Bidder/ Contractor
(Office Seal)

Place _____
Date _____

Witness:_____
(Name & Address) _____
_____

Witness:_____
(Name & Address) _____
_____

Clause on IP in the tender

Integrity Pact (IP)

(a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

Sl	IEM	Email
1.	Shri Otem Dai, IAS (Retd.)	iem1@bhel.in
2.	Shri Bishwamitra Pandey, IRAS (Retd.)	iem2@bhel.in
3.	Shri Mukesh Mittal, IRS (Retd.)	iem3@bhel.in

(b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.

(c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

Note:

No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are provided below:

Details of contact person(s):

(1)
Name:_____
Deptt: _____
Address: _____
Phone: (Landline/ Mobile)
_____
Email: _____
Fax: _____

(2)
Name:_____
Deptt: _____
Address: _____
Phone: (Landline/ Mobile)
_____
Email: _____
Fax: _____