



A Maharatna Company
ISO 9001 Company
ISO 50001 Company

பாரத் ஹெவி இலெக்ட்ரிகல்ஸ் லிமிடெட்
भारत हेवी इलेक्ट्रिकल्स लिमिटेड
Bharat Heavy Electricals Limited
(A Government of India Enterprise)
Tiruchirappalli – 620 014

MATERIALS MANAGEMENT

Phone: 0431 – 257 4166, 4363; E-mail: sbrajesh@bhel.in, mjijby@bhel.in; www.bhel.com

NOTICE INVITING e-TENDER

Dear Sir/ Ma'am,

Ref : **Tender No. 1802300046 dt. 16.09.2023.**

Subject : Two-part **e-Tender** inviting techno-commercial and price bids for Design, Manufacturing and supply of SCR Dedusting System for Panki SCR Project and Supervision of Erection & Commissioning.

Kindly submit your competitive offer as per the tender terms and conditions given in the tender document through e-procurement portal <https://eprocurebhel.co.in/> only.

1.	Bid submission start date	26.09.2023, 09:00 Hrs.
2.	Bid submission end date	16.10.2023, 12:00 Hrs.
3.	Bid opening date (Part-I)	16.10.2023, 16:00 Hrs.
4.	Date of price bid opening	The date/ time of price bid opening will be intimated to the techno-commercial qualified tenderer separately.

Note: Change of dates if any will be published as corrigendum. Bidder to check e-procurement portal regularly for updates.

The tender will be evaluated on total package basis.

List of Items:

BOQ Sl. No.	Item Description	Material Code	Qty	Unit
MAIN SUPPLY				
1	SCR DEDUSTING SYSTEM A set consists of all the de-dusting equipments, valves & instruments required to complete the entire system as specified in specification and drawings indicated in the enquiry	L17281SR50001001	1	SET
Supervision of erection and commissioning				
2	Charges for Supervision of erection and commissioning Of SCR Dedusting System as per Sl. No. 7 of Annexure-A.	EC	15	Man Day

Following list of documents are part of this tender and shall be deemed to form an integral part of contract:

1. Annexure A - Techno - commercial terms and conditions.
2. Technical Specifications and prequalification requirements as mentioned in clause 1(a, b and c) of Annexure-A.
3. No Deviation Format.
4. Local content certification formats.
5. PBG format along with consortium bank list.
6. Annexure-X Brief procedure for conduct of conciliation proceedings.

General Instructions

1. Clarifications required if any shall be send to email ID sbrajesh@bhel.in and mjijby@bhel.in.
2. Please quote enquiry no., date and due date in all correspondences.
3. This is only a request for quotation and not an order.

4. Bidder to submit the offer through e-procurement portal only. Offer submitted through any other mode will not be considered.

Thanking you,
For **Bharat Heavy Electricals Limited**

SB Rajesh Kummar

Dy. Manager / Materials Management

Fourth floor, 24 Building

B.H.E.L., Tiruchirappalli – 620 014, Tamil Nadu

Phone: 0431-2574166

Email: sbrajesh@bhel.in



An ISO 9001
Company

Bharat Heavy Electricals Limited
(High Pressure Boiler Plant)
Tiruchirappalli-620 014, Tamil Nadu, India
Dept: MATERIALS MANAGEMENT/BOI

Annexure – A- Terms and Conditions

ACCEPTANCE OF TECHNO - COMMERCIAL TERMS AND CONDITIONS BY THE BIDDERS

Description of the Equipment and Scope of work:		Design, Manufacturing and supply of SCR Dedusting System and Supervision of Erection & Commissioning
Projects		Panki 1X660 MW project
BHEL Tender No. & Date		1802300046 dated 16.09.2023
<i>To be filled by bidder</i>		
Name of the firm (Bidder)		:
Offer reference		:
Address		:
Contact details		<u>Contact person 1</u> Name: Designation: Office Phone: Mobile: e-mail: <u>Contact person 2</u> Name: Designation: Office Phone: Mobile: e-mail:
Sl. No.	Terms and conditions	Vendor's confirmation
1 (a)	Technical Requirements: A set of SCR catalyst de-dusting system consists of all the de-dusting equipments, valves & instruments required to complete the entire system as specified in below mentioned specification and drawings <ol style="list-style-type: none"> 1. Introduction on De-dusting system (Ref. DDS/INTR) 2. Specification TSR:006 Ash sweeper system/01. 3. Specification TSR:007 Sonic horns system/01. 4. P&ID of SCR reactor: 0-SC-288-90001. 5. SCR Reactor arrangement: 1-SR-000-00004. 6. P&ID for Ash Sweeper system (TP Details) :3-SR-500-00075. 7. P&ID for Sonic horn system (TP Details) :3-SR-500-00076. 8. De-Dusting system guarantee: SCR/DD/PG/001. 9. Valve schedule :SCR/1728/VALVE/001. 10. P&ID of Catalyst De-dusting System: 0-SR-056-00022 	
1 (b)	Quality Plan shall be submitted by bidder in case of placement of PO. Supply shall be as per the quality plan approved by BHEL/end customer.	

1 (c)	<p>Pre-qualification requirement (PQR): Offer shall be considered only if bidder is meeting Tender Prequalification requirement (Annexure-B & C). Vendor to comply with Pre-Qualification requirement of the tender and submit along with their technical bid - the credentials and other documents as indicated in the PQR in the format prescribed. Otherwise their offer will get rejected.</p>	
1 (d)	<p>Evaluation method The tender will be evaluated on total package basis. Evaluation and L1 identification shall be on total landed cost to BHEL including all cost up to destination. Currency of evaluation shall be INR. Rate quoted in Foreign currencies will be converted to INR by multiplying with the Exchange rate (SBI TT Selling rate) as on the technical bid opening date. If the date of opening happens to be a bank holiday, then the forex rate as on previous bank (SBI) working day shall be taken.</p>	
1 (e)	Vendor shall quote as per the enclosed price Schedule format only.	
1(f)	<p>Pre-bid meeting In order to avoid clarification/ confirmation after opening of bids, Pre-bid conference (online) will be held so as to provide an opportunity to the participating bidders to interact with BHEL with regard to various tender provisions/tender specifications, before the bids are submitted. Pre bid meeting date: 29.09.2023, 10 AM IST Video Conferencing link: Click here to join the meeting</p>	
2 (a)	<p>Firm Price: The quoted / finalised rates shall be Firm till execution of the supplies. Offer with PVC clause will not be considered.</p>	
2 (b)	<p>The Tender will be operated in two part bid system. One-part consisting of PQR, Technical bid with Commercial terms & conditions and other part is Price Bid. Based on the PQR compliance and technical suitability, vendors will be short-listed. The price Bid of short listed vendors will be opened on a suitable date with due intimation to vendors. Reverse Auction is applicable for this tender.</p>	
2 (c)	<p>REVERSE AUCTION: <i>BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on www.bhel.com) for this tender. RA shall be conducted among all the techno- commercially qualified bidders.</i></p> <p><i>Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered as initial bids of bidders in RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking.</i></p>	

3	<p>Delivery term: Indigenous Suppliers The quote shall be on FOR Panki project site, Uttar Pradesh basis inclusive of Packing, forwarding, Freight. Transit Insurance is under BHEL scope. Import Supplier: Import vendors to submit offers on CFR (Cost & Freight), Chennai port (LILO – Liner in Liner Out) basis. Port of loading should be indicated without fail. Port of discharge should be Chennai.</p>													
4 (a)	<p>Payment Terms (Indigenous):</p> <p>100% direct payment through EFT within 45 days for MSE Vendors from the date of dispatch of materials against site acknowledgement and 10% PBG. 100% direct payment through EFT after 60 days for Medium Vendors and 90 days for Non-MSE vendors from the date of dispatch of materials against site acknowledgement and 10% PBG.</p> <p>Payment Terms (Import):</p> <p>Option:1: BHEL Payment term is 100% payment on CAD basis after 90 days from the date of receipt of documents, specified in PO, at BHEL bank and against 10% PBG. Respective bank charges to respective account.</p> <p>Option:2: If supplier insists for LC, only Usance LC with 120 days credit will be opened one month prior to material readiness. Hence, supplier shall intimate the material readiness accordingly for opening of LC. LC validity period will be 90 days and for any extension, applicable charges will be to supplier's account. Upon LC expiry, the subsequent bills will be against CAD basis. Any deviation in the above payment term will attract loading as mentioned below. MCLR rate of SBI p.a. + 6% (as applicable on the date of bid opening. Techno-commercial bid opening in case of two part bids) shall be considered for loading for the period of relaxation sought by bidders subject to competent authority approval.</p> <p>Example of the same is provided below.</p> <table border="1" data-bbox="300 1765 1145 1966"> <thead> <tr> <th>Payment term</th> <th>Relaxation period (days)</th> <th>Loading (@ MCLR 8.50% p.a. + 6%)</th> </tr> </thead> <tbody> <tr> <td>LC 90 days</td> <td>30</td> <td>1.19%</td> </tr> <tr> <td>LC 60 days</td> <td>60</td> <td>2.38%</td> </tr> <tr> <td>LC 30 days</td> <td>90</td> <td>3.58%</td> </tr> </tbody> </table>	Payment term	Relaxation period (days)	Loading (@ MCLR 8.50% p.a. + 6%)	LC 90 days	30	1.19%	LC 60 days	60	2.38%	LC 30 days	90	3.58%	<p>Option-1/Option-2 (Import vendors shall mark the payment option)</p>
Payment term	Relaxation period (days)	Loading (@ MCLR 8.50% p.a. + 6%)												
LC 90 days	30	1.19%												
LC 60 days	60	2.38%												
LC 30 days	90	3.58%												
4 (b).	<p>Performance Bank Guarantee: Vendor shall guarantee the performance of the de-dusting system as per SCR/DD/PG/001. Vendor is liable for the performance of complete de-dusting system as a</p>													

	<p>package inclusive of ash sweeper system and sonic horn system. BHEL require a performance Bank Guarantee to a value of 10% of supply value after supply of items. The PBG shall be in BHEL format (Format attached) which is to be opened in any one of the banks mentioned under List of Consortium Banks attachment. All banks charges shall be to vendor account only. Any deviation on PBG may make the offer liable for rejection. Vendor shall submit the PBG valid minimum for guarantee/warranty period with additional claim period of 3 to 6 months, along with the submission of invoice.</p> <p>If the performance could not be established within Guarantee period under any circumstances, the PBG shall be extended by vendor subsequently till the time of establishment of performance guarantee or up to a period of three years from the date of supply, whichever is earlier. All the extension charges shall be borne by vendor.</p>	
5 (a).	<p>Liquidated damages (LD):</p> <p>a) Time is the essence of the contract.</p> <p>b) The ordered items shall be delivered as per the delivery period mentioned in the Purchase Order.</p> <p>c) In case the supplier supplies the ordered items beyond the delivery period specified, Liquidated Damages -LD - as detailed below shall be will be levied from the supplier without prejudice to any other relief /compensation available to BHEL, Tiruchirapalli under any other condition of the contract/applicable legal provisions.</p> <p>d) Failure to dispatch the materials in the time as per the delivery quoted in our Purchase Order(PO) would make the supplier liable to an un-conditional LD at the rate of 0.5% of the total order value per week of the delay or part thereof subject to a maximum of 10% of the total order value.</p> <p>e) Any deviation from the above LD clause, loading will be applied to the extent to which it is not agreed by the bidder (at offered value).</p> <p>f) Indigenous: For “FOR Delivery terms”, Lorry way bill date will be taken for LD calculation for cases where e-way bill is not mandatory. Wherever E Way Bill is involved, the date of commencement of movement of vehicle as reflected in E way Bill [the ‘Valid from’ date in the E way Bill] will be taken for LD calculation</p> <p>g) Import: For CFR terms, BL date will be considered for LD calculation.</p>	
5(b).	<p>In case of PO placements, required documents have to be submitted for approval within 15 days from the date of PO & reply for any further clarification has to be within 7 days. Any delay beyond the above specified period will be considered during LD calculation.</p>	
6 (a).	<p>Warranty Period:</p> <p>Vendor shall give warranty against design & manufacturing defects for a period of 12 months from the date of commissioning or 18 months</p>	

	from the date of supply whichever is earlier.	
6 (b).	<p>Repair & replacements: Within the warranty period, vendor has to replace / rectify the defective/ damaged items on free of cost within a reasonable time of reporting from our end. All incidental charges like freight, insurance and customs duty are to your account only. The defective parts and components shall be collected by your Indian agent or / authorized person, only after completing the replacement / repairs. If the supplier fails to replace / rectify the defective/ damaged items on free of cost within 60 days of reporting from our end, the same shall be treated as failure to execute the contract and actions as per the Guidelines for Suspension of Business Dealings with Suppliers /Contractors available in the webpage: http://www.bhel.com/vender_registration/vender.php. would be taken against such supplier without prejudice to the other remedies available to BHEL under the contract and law in this regard.</p>	
6 (c).	No Deviation is permitted on Warranty period. If still vendor offered any deviation on the warranty period, it may lead to rejection of offer.	
7	<p>Erection and Commissioning support: Seller shall depute their service engineer for erection and commissioning support. If commissioning engineer is deputed from Indian office, then the payment will be released in INR only. Conversion of foreign currency to INR shall be as per clause 1(d).</p> <p>This service will be utilized by BHEL-site through Power sector region on site readiness of SCR of each boiler. Separate PO will be released by BHEL-site through Power Sector region to avail the vendor's supervision service.</p> <p>The bidder will be informed well in advance for the visit at project site for SCR of each boiler separately.</p> <p>All TA/DA, Site Expenses, Travel charges boarding and lodging shall be borne by the bidder and shall be inclusive in supervision portion. Payment will be made by BHEL-site for supervision of Erection and Commissioning charges within 45 days for MSE vendors, after 60 days for Medium vendor and after 90days for non-MSME vendors on completion of Erection and Commissioning.</p> <p>Price to be quoted by the bidder in terms of price per man-day for erection and commissioning support.</p> <p>The price calculated for 15 days of Supervision of erection and commissioning or 2 % of the total contract value of Material Supply whichever is lower shall form part of the Total cost to BHEL and will be considered for price comparison.</p> <p>Depending upon the actual duration of Supervision of erection and commissioning availed, the payment will be paid by BHEL- Power Sector regions based on the vendor quoted amount (price per man-</p>	

	<p>day) with total Erection and Commissioning Supervision charges limited to cap of 2% of the total contract value of Main supply items.</p> <p>In any case, the Charges for Supervision of Erection and Commissioning shall not be paid more than 2% of the total contract value of Material supply and the supplier shall render the service abiding by the above condition.</p>	
8	<p>Inspection and testing requirements: Inspection by BHEL/ BHEL approved TPIA. Inspection and testing requirements are to be carried out as per the specification and BHEL/ end customer approved QAP and all test certificates are to be submitted in complete set as indicated in our specification/QAP. In case of order, vendor to give the inspection notification for all witness test as per the QP for BHEL/end customer 3 working days before date of inspection.</p>	
9.	<p>Duty benefits for import vendors</p> <p>a) Whether PTA/ CEPA or any other agreement/treaty between respective Governments/Countries exists and the same is applicable for your supplies w.r.t this Enquired Items/tender.</p> <p>b) If yes, mention the Concessional Customs Duty (Such Duty Benefits) %</p> <p>c) Documentary proof for the applicable Concessional Customs Duty (eg. PTA/ CEPA or other agreement) shall be submitted along with the Part-1 bid.</p> <p>d) Relevant documents and details to avail the above concessional duty benefits by BHEL shall be submitted by the supplier along with dispatch documents.</p> <p>e) In the event of seller failing to provide appropriate documents along with dispatch documents for purchasers to avail disclosed concessional duty benefits in India, financial loss, so incurred, will be to the seller’s account.</p> <p>Note: Evaluation of the Price bids will be based on the above details only and unless mentioned/furnished by the vendor, Customs Duty benefit will not be applied for evaluation purposes.</p>	<p>YES / NO</p> <p>SUBMITTED/NOT SUBMITTED</p> <p>CONFIRMED/NOT CONFIRMED</p> <p>CONFIRMED/NOT CONFIRMED</p>
10.	<p>Risk purchase clause:</p> <p>a. In the event of any successful Tenderer's failure to fulfil any of the tender / Contract obligations including supply of whole or any part of the ordered items as per Contract / Agreement, BHEL has the right to terminate the contract and purchase from elsewhere, at the risk and cost of the defaulted supplier, either the whole of the goods or any part which the supplier has failed to deliver or dispatch within the time stipulated in the contract or if the same were not available, the best and nearest available substitute thereof. The supplier shall be liable for the additional expenditure/difference in Cost, if any, including consequential losses which BHEL may sustain by reason of risk purchase in addition to the applicable LD as per the Purchase order/contract.</p> <p>b. The decision of BHEL with regard to the additional expenditure /</p>	

	<p>difference in cost and consequential losses incurred by BHEL shall be final and binding on the supplier.</p> <p>c. The amount recoverable under risk purchase shall be recovered from the defaulted supplier in all or any of the following manners:</p> <ul style="list-style-type: none"> • from dues available in the form of Bills payable to defaulted supplier, SD, BGs against the same contract. • from the dues payable to defaulted supplier against other contracts in the same Region/Unit /any other region/unit In-case recoveries are not possible with any of the above available options, Legal action shall be initiated for recovery against defaulted supplier. <p>GST is applicable on amount recoverable from vendors under risk purchase clause as per Govt. Circular No. 178/10/2022-GST dt. 03.08.2022.</p>	
11.	<p>Suspension of Business Dealings:</p> <p>The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the firms debarred across BHEL, shall be rejected. The list of firms debarred across BHEL is available on BHEL website www.bhel.com.</p> <p>1.0 Integrity commitment, performance of the contract and punitive action thereof:</p> <p>1.1. Commitment by BHEL:</p> <p>BHEL commits to take all measures necessary to prevent corruption in connection with the tender process and execution of the contract. BHEL will during the tender process treat all Bidder(s) in a transparent and fair manner, and with equity..</p> <p>1.2. Commitment by Bidder/ Supplier/ Contractor:</p> <p>1.2.1. The bidder/ supplier/ contractor commit to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India.</p> <p>1.2.2. The bidder/ supplier/ contractor 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 and shall adhere to relevant guidelines issued from time to time by Govt. of India/ BHEL.</p> <p>1.2.3. The bidder/ supplier/ contractor will perform/ execute the contract as per the contract terms & conditions and will not default without any reasonable cause, which causes loss of business/ money/ reputation, to BHEL.</p> <p>If any bidder/ supplier/ contractor during pre-tendering/ tendering/</p>	

	<p>post tendering/ award/ execution/ post-execution stage indulges in malpractices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then, 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.</p>	
12.	<p>Delivery Period: Delivery Period shall be 16 weeks from the date of Manufacturing Clearance. Manufacturing clearance will be given based on the site readiness of the SCR of the boiler and final document approval (GA drawing, data sheet and Quality plan) Material shall be dispatched after obtaining dispatch clearance from BHEL. The delivery dates mentioned above and given in the PO are indicative only. The exact delivery date will be intimated by BHEL while giving dispatch clearance. The supplier shall keep the manufactured items safely till the dispatch clearance is given by BHEL.</p>	
13.	<p>Documents are to be submitted along with technical bid (Part-1)</p> <ol style="list-style-type: none"> 01. Covering letter 02. Unpriced offer 03. Filled technical specification, datasheets and drawings as mentioned in clause 2.12 of specifications TSR:006 & TSR:007. 04. Filled BHEL Terms and condition sheet (Annexure-A) 05. Filled Pre-Qualification requirement (Annexure- B & C) along with supporting documents 06. Detailed BOM of the package with weight details of each item. 07. Third party non-disclosure agreement 08. MSE documents (if applicable) 09. Make In India self certification in attached format (if applicable) 10. Filled up and Signed No Deviation Format 11. Filled up and signed Integrity Pact 12. Documents in support of duty benefits (if applicable) 13. Filled up Annexure-P (% price break up) <p>Documents are to be submitted along with Price bid (Part-2)</p> <ol style="list-style-type: none"> 01. Priced offer as per the format attached with enquiry. <p>Note: All the pages of documents are to be signed and sealed by authorized signatory of the company. Any query during enquiry stage shall be replied within three days failing which offer may be rejected as non-responsive.</p>	
14.	<p>Offer Validity: 120 days minimum from techno commercial bid opening (Part-1)</p>	
15.	<p>O & M manuals: Detailed O&M manuals shall be furnished. Three soft copies of O&M manuals in (CD ROM) compact disc to be submitted. One hard copy and one CD should be sent along with</p>	

	transit assembly to site directly.	
16.	Kindly indicate the GST No of your Firm	
17.	Kindly Indicate the HSN Code for all items	
18.	Please indicate the applicable GST % (IGST)	
19.	Response to Tenders for Indigenous supplier will be entertained only if the vendor has a valid GST registration Number (GSTIN) which should be clearly mentioned in the offer. If the dealer is exempted from GST registration, a declaration with due supporting documents need to be furnished for considering the offer. Dealers under composition scheme should declare that he is a composition dealer supported by the screen shot taken from GSTN portal. The unregistered dealer as well as the composition dealer has to submit an undertaking stating that they will not claim GST during the execution of the contract even if their status under GST changes to regular tax payer. The dealer has to submit necessary documents if there is any change in status under GST.	
20.	Supplier shall mention their GSTIN in all their invoices (incl. credit Notes, Debit Notes) and invoices shall be in the format as specified/prescribed under GST laws. Invoices shall necessarily contain Invoice number (in case of multiple numbering system is being followed for billing like SAP invoice no, commercial invoice no etc., then the Invoice No. which is linked/uploaded in GSTN network shall be clearly indicated), Billed to party (with GSTIN) & Shipped to party details, item description as per PO, Quantity, Rate, Value, applicable taxes with nomenclature (like IGST, SGST, CGST & UTGST) separately, HSN/ SAC Code, Place of Supply etc. Wherever E-Invoice is applicable, the tax invoice/ CN / DN submitted by the vendor must contain the QR code generated in E-Invoice Portal & IRN.	
21.	All invoices shall bear the HSN Code for each item separately (Harmonized System of Nomenclature)/ SAC code (Services Accounting Code)	
22.	Invoices will be processed only upon completion of statutory requirement and further subject to following: i. Vendor declaring such invoice in their GSTR-1 Return/ IFF ii. Receipt of Goods or Services and Tax invoice by BHEL	
23.	As the continuous uploading of tax invoices in GSTN portal (in GSTR-1/ IFF) is available for all (i.e. both Small & Large) tax payers, all invoices raised on BHEL may be uploaded immediately in GST portal on dispatch of material /rendering of services. The supplier shall ensure availability of Invoice in GSTN portal before submission of invoice to BHEL. Invoices will be admitted by BHEL only if the invoices are available in GSTN portal (in BHEL's GSTR-2A/ GSTR-2B).	
24.	In case of discrepancy in the data uploaded by the supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note or debit note (details also to be	

	uploaded in GSTN portal) for the shortages or rejections in the supplies or additional claims, within the calendar month informed by BHEL.	
25.	In cases where invoice details have been uploaded by the vendor but failed to remit the GST amount to GST Department (Form PMT-08 or Form GST RET-01 to be submitted) within stipulated time, then GST paid on the invoices pertaining to the month for which GST return not filed by the vendor will be recovered from the vendor along with the applicable interest (currently 24% p.a) and all subsequent bills of the vendor will not be processed till filing of the GST return by the vendor	
26.	In case GST credit is denied to BHEL due to non-receipt or delayed receipt of goods and/ or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, GST amount claimed in the invoice shall be disallowed to the vendor.	
27.	Where any GST liability arising on BHEL under Reverse Charge (RCM), the vendor has to submit the invoices to BHEL well within the timeline prescribed in GST Law, to enable BHEL to discharge the GST liability. If there is a delay in submission of invoice by the vendor resulting in delayed payment of GST by BHEL along with Interest, then such Interest payable or paid shall be recovered from the vendor.	
28.	GST TDS will be deducted as per Section 51 of CGST Act 2017 and in line with Notification 50/2018 –Central Tax dated 13.09.2018. GST TDS certificate will be generated in GSTN portal subsequent to vendor accepting the TDS deduction in the GSTN portal & the vendor can directly download the Certificate from the GSTN Portal.	
29.	<p>MSE VENDOR:</p> <p><i>i. If L1 vendor is an MSE vendor entire project package will be ordered on L1 vendor.</i></p> <p><i>ii. If a Non MSE vendor is coming as L1, then L1 prices will be counteroffered on MSE vendor who is quoting price within the price band L1+15% and if they are agreeing, purchase order will be awarded for full/complete supply of total tendered value to MSE.</i></p> <p><i>iii. If more than one MSE vendors are available in the L1+15% price band then lowest of the MSE vendor will be selected for counteroffering. If lowest MSE vendor is not accepting it will be counteroffered to the next MSE vendor in the price band and so on.</i></p> <p><i>iv. Finally if none of the MSE vendor in the price band is not accepting it will be ordered on L1 non MSE vendor.</i></p> <p>Payment for MSE Indigenous vendors will be as per MSMED Act, 2006</p> <p>MSE suppliers can avail the intended benefits only if they submit along with the offer, attested/notarized copy of Udyam Registration certificate.</p>	

	<p>Non submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry, in case of any deficiency in the above required documents or in case the documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal even if submitted earlier.</p>	
30.	<p><u>Make in India:</u> For this procurement, the local content to categorize a supplier as a Class I local supplier/ Class II local Supplier/ Non- Local supplier and purchase preference to Class I local supplier, is as defined in Public Procurement (Preference to Make in India), Order 2017 dated 04.06.2020 issued by DPIIT. In case of subsequent orders issued by the nodal ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT.</p> <p>The local supplier at the time of tender, bidding or solicitation shall be required to provide self-certification that the item offered meets the minimum local content and shall give details of the location(s) at which the local value addition is made.</p> <p>If the quoted value is exceeding 10 crores, supplier shall submit along with Part-I bid a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.</p>	
31.	<p><u>Packing Requirements (for indigenous vendors):</u></p> <ul style="list-style-type: none"> ● Packing should ensure the healthiness of the Equipment including all electrical Accessories which may be stored for longer period at Site conditions (open to atmosphere). ● All openings (Fluid, Pneumatic & Electric) shall be firmly capped. ● Items shall be packed in suitable enclosure (to prevent damage/rusting due to Seashore atmospheric conditions) from all four sides and also it should be covered with polythene to make it water proof. ● Packing and struts shall be used to arrest rolling of items and to avoid transit damage. ● Limit switches and such components shall be encapsulated properly with suitable material like Thermocol. ● Suitable arrangement (lugs/hooks) for loading and unloading of the equipment in packed condition at site. <p><u>Packing Requirements (for import vendors):</u></p> <ul style="list-style-type: none"> ● Packing shall be sea worthy. 	
32.	<p>The preferred shipment mode "Containerized Cargo or Break Bulk" shall be specified clearly in the offer.</p>	

FOR CFR INCO TERMS – CONTAINERIZED CARGO

- For CFR terms, moved through CONTAINERS (Suppliers should clearly specify this in their offer) it would be presumed by BHEL that the freight charges quoted is on LILO (LINER IN LINER OUT) basis including extra charges, if any, like Container Imbalance Charges, Trade Imbalance charges or any other charges payable to the Liner. No other charges other than the quoted Freight rate will be paid by BHEL excepting applicable Terminal Handling Charges, Container cleaning Charges, DO charges to Shipping Liner at Discharge Port. 14 FREE DAYS FOR Container detention shall be provided.
- In case of shipment through Containers on CFR basis, the BL should bear the endorsement that “14 free days for Container Detention is applicable”.

FOR BREAKBULK CARGO:

- For CFR terms, moved through BREAK BULK BASIS (Suppliers should clearly specify this in their offer) it would be presumed by BHEL that the freight charges quoted is on LILO (LINER IN LINER OUT) basis.
- The materials will be Custom cleared from Port itself.

Important Information for Import Suppliers:

- Indian Customs has imposed a penalty on late filing of Bill of Entries (Air/Sea Shipments) by the importer. The maximum free time allowed is 24 hrs from the time of arrival of cargo at final port of discharge. At present penalty is Rs.5000/- per day (for Initial 03 days) & Rs.10000/- per day (thereafter). Hence the supplier shall submit the Non-Negotiable Documents (Bill of Lading, Commercial Invoice, Packing List, Certificate of Origin, etc.) either by email or post/courier to BHEL well before the landing of cargo at final port of discharge.
- In case of any penalty due to late filing of Bill of entry for reasons attributable to suppliers (as listed below), the same will be recovered from the bills of supplier:
 - Non availability of Non-Negotiable Documents (NNDs) before the cargo arrival
 - Discrepancy in documents
 - Short landing of Consignments (For shipments on CFR–Chennai Port)
- For all the shipments for the contracts (POs) finalized on CFR-Chennai Port basis,
 - Delivery Orders involving multiple agencies like liners/freight forwarders are not allowed. To avoid any delay, BHEL prefers Single agency office at the final discharge Port (Chennai) for issuing the Delivery Order to BHEL.
 - The detention/demurrage charges arise due to the delay in collection of Delivery Orders from multiple agencies of liner/freight forwarder also whose offices are not at available Chennai, the same amount will be deducted from Supplier’s

bills.

- Apart from the Terminal Handling Charges, Container cleaning Charges & Delivery Order Charges at final port of discharge, any other charges will not be borne by BHEL.
- The liner/freight forwarders shall be informed by the Vendor not to claim any additional charges (like charges listed below) for issuing Delivery Order. In case if the liner/freight forwarder claims such charges, the same amount will be deducted from the Vendor bills with/without any prior intimation in order to avoid the delay in Customs clearance. The likely additional/hidden charges are listed below
 - CIC - Container Imbalance Charges/Surcharges
 - EIC - Equipment Imbalance Charge/Surcharges
 - CAF - Container/Currency Adjustment Factor
 - BAF - Bunker adjustment Factor
 - RDS - Rupee Depreciation Surcharge
 - CDS - Currency Depreciation Surcharge
 - PCS - Port Congestion Surcharge
 - LSS - Low Sulphur Surcharge
 - Devanning Charges

Transport Conditions for Import:

The Original Documents (Bill of Lading, Invoice, Packing List, Certificate of Origin & Test Certificate) shall reach BHEL well in advance before the vessel arrival. The soft copies of the above shall be forwarded to BHEL immediately after shipment.

- 14 FREE DAYS for Container detention at final port of destination shall be provided and the same to be endorsed in the Bill of Lading. If there is no free day or less than 14 free days provided by the supplier, the actual cost incurred towards detention charges due to non-availability of above said free days will be recovered from the supplier Invoice.
- In the event of delayed submission of documents/ non-submission of documents by the supplier as per the mutually agreed terms, an amount up to 5% of the invoice value will be retained towards detention/ demurrage & other charges and the difference if any between actual charges and recovery will be settled separately through supplementary invoice.
- In such cases, the Supplier shall authorize the Steamer / Shipping agent / transporter to freely release the consignment to BHEL by providing a "Surrender Bill of Lading".
- Otherwise, No-objection Certificate shall be issued to the Liner, authorizing BHEL to get the Delivery Order without producing the Original Bill of Lading.

	<ul style="list-style-type: none"> ○ This is required to ensure avoidance of detention/ demurrage at Chennai Sea-port that may arise in case of delayed presentation of documents by the Seller. 	
33.	<p><u>Fraud Prevention Policy</u> Bidder along with its associate /collaborators /sub-contractors /sub-vendors / consultants / service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.</p>	
34.	<p><u>Cartel Formation</u> All the firms should desist from forming cartel as the practice is prohibited under Section 3(3) (a) & (d) of the competition Act 2002. If any such instance is observed during this tender will attract disciplinary action as per BHEL policies. 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.</p>	
35.	<p><u>Resolution of Disputes</u> The Parties agree that if at any time (whether before, during or after the arbitral or judicial proceedings), any Disputes (which term shall mean and include any dispute, difference, question or disagreement arising in connection with construction, meaning, operation, effect, interpretation or breach of the contract/tender which the Parties are unable to settle mutually), arise inter-se the Parties, the same may, be referred by either party to Conciliation to be conducted through Independent Experts Committee to be appointed by competent authority of BHEL from the BHEL Panel of Conciliators. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof. Notes: 1. No serving or a retired employee of BHEL/Administrative Ministry of BHEL shall be included in the BHEL Panel of Conciliators. 2. Any other person(s) can be appointed as Conciliator(s) who is/are mutually agreeable to both the parties from outside the BHEL Panel of Conciliators. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided in Annexure X to this Terms and conditions.</p>	

The Annexure X together with its appendices will be treated as if the same is part and parcel hereof and shall be as effectual as if set out herein in this terms and conditions.

Except as provided elsewhere in this Contract, in case amicable settlement is not reached between the parties, in respect of any dispute or difference; arising out of the formation, breach, termination, validity or execution of the Contract; or, the respective rights and liabilities of the Parties; or, in relation to interpretation of any provision of the Contract; or, in any manner touching upon the Contract, then, either Party may, by a notice in writing to other Party refer such dispute or difference to sole arbitration of an arbitrator appointed as per the Arbitration and Conciliation Act, 1996 (India) or statutory modification or re-enactment thereof and the rules made thereunder and for the time being in force.

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

This contract shall be governed, construed and interpreted in accordance with the laws of India.

Subject as aforesaid, the provision of Arbitration & Conciliation Act 1996 (India) or statutory modification or re-enactment thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceeding under this clause.

The seat of arbitration shall be Trichy, Tamil Nadu, India

The cost of arbitration shall be borne as per the award of the Arbitrator.

Subject to arbitration in terms of clause above, the Courts at Trichy, Tamil Nadu, India shall have exclusive jurisdiction over any matter arising out of or in connection with this Contract.

Notwithstanding the existence or any dispute or difference and/or reference for the arbitration, the vendor shall proceed with and continue without hindrance the performance of its obligation under this Contract with due diligence and expedition in a professional manner except where the Contract has been terminated by either Party in terms of this Contract.

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

In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between

	Central Public Sector Enterprises (CPSEs)/Port Trusts inter se and also between CPSEs and Government Departments/Organizations (Excluding disputes concerning Railways, Income Tax, Customs & Excise Departments, such dispute or difference shall be taken up by either party for its resolution through AMRCD as mentioned in DPE OM No.05/003/2019-FTS-10937 dtd. 14 th December, 2022 and the decision of AMRCD on the said dispute will be binding on both the parties.	
36.	<p><u>Force Majeure clause</u></p> <p>a. Notwithstanding the provisions contained in other clauses, the supplier shall not be liable for imposition of any such sanction so long the delay and/or failure of the supplier in fulfilling its obligations under the contract is the result of an event of Force Majeure. For purposes of this clause, Force Majeure means an event beyond the control of the supplier and not involving the supplier's fault or negligence and which is not foreseeable and not brought about at the instance of the party claiming to be affected by such event and which has caused the non – performance or delay in performance. Such events may include, but are not restricted to, wars or revolutions, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes excluding by its employees, lockouts excluding by its management, freight embargoes and Acts of GOD.</p> <p>b. If a Force Majeure situation arises, the supplier shall promptly notify the Purchaser/Consignee in writing of such conditions and the cause thereof within twenty-one days of occurrence of such event. Unless otherwise directed by the Purchaser/Consignee in writing, the supplier shall continue to perform its obligations under the contract as far as reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.</p> <p>c. If the performance in whole or in part or any obligation under this contract is prevented or delayed by any reason of Force Majeure for a period exceeding sixty days, either party may at its option terminate the contract without any financial repercussion on either side.</p> <p>d. In case due to a Force Majeure event the Purchaser/Consignee is unable to fulfil its contractual commitment and responsibility, the Purchaser/Consignee will notify the supplier accordingly and subsequent actions taken on similar lines described in above sub-paragraphs.</p>	
37.	Set off : BHEL shall have the right to recover any money which in the sole opinion of BHEL is due from the supplier from any money due to the supplier under this Contract or any other contract or from the Security Deposit/BG furnished by the supplier under this Contract or any other contract.	
38.	As per extant provisions of Income Tax Act,1962 in India, foreign suppliers have to submit the following documents to avail benefits under DTAA at time of each dispatches, failing which TDS will be applicable considering Business Income in India. (Current TDS rate @	

	<p>40% as per the extant law provisions) plus applicable surcharge and cess is to be deducted u/s. 195 of I.T. Tax Act.</p> <ul style="list-style-type: none"> • Valid Tax Residency Certificate issued by Govt / Tax agency of country. • Form 10F duly filed signed. (sample copy as per Annexure-DT1) • No PE and No Business connection declaration in mills letter head. • Declaration of No Significant Economic Presence (SEP) in India as per Indian I.T Rule 11UD & indemnity to pay taxes at later stages on demand. • Self-declaration that Non-resident is eligible to obtain benefits of relevant DTAA between India and Supplier's country. (sample copy as per Annexure-DT2) 	
39.	<p><u>Conflict of Interest Among Bidders/Agents:</u></p> <p>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:</p> <ol style="list-style-type: none"> a. they have controlling partner (s) in common; or b. they receive or have received any direct or indirect subsidy/ financial stake from any of them; or c. they have the same legal representative/agent for purposes of this bid; or d. they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; or e. Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly! Assemblies from one bidding manufacturer in more than one bid; or f. In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following: <ol style="list-style-type: none"> 1. The principal manufacturer directly or through one Indian agent on his behalf; and 2. Indian/foreign agent on behalf of only one principal; <p style="text-align: center;">or</p> 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.	
Note.	<ol style="list-style-type: none"> 1. In the event of our customer order covering this tender being cancelled /placed on hold / otherwise modified, BHEL would be constrained to accordingly cancel / hold / modify the tender at any stage of execution. 2. BHEL may negotiate the L1 rate, if not meeting our budget / estimated cost. BHEL may re-float the tender opened, if L1 price is not acceptable to BHEL even after such negotiation . Any deviation from the conditions specified in TECHNO - COMMERCIAL TERMS AND CONDITIONS - Annexure-A, will lead to rejection of offer. 3. Any change in applicable rates of Tax or any other statutory levies (Direct / Indirect) or any new introduction of any levy by means of statute and its corresponding liability for the deliveries beyond the agreed delivery date for reasons not attributable to BHEL will be to vendors account. BHEL will not reimburse the same and any subsequent claim in this respect will be summarily rejected. 4. Any other Techno–Commercial Terms indicated by the vendor in their offer elsewhere will be ignored. BHEL will proceed with tender evaluation as per Annexure-A only. 	

FORM NO. 10F

[See sub-rule (1) of rule 21AB]

Information to be provided under sub-section (5) of section 90 or sub-section (5) of section 90A of the Income-tax Act, 1961

I, *son/daughter of Shri..... in the capacity of (designation) do provide the following information, relevant to the previous year..... *in my case/in the case of..... for the purposes of sub-section (5) of *section 90/section 90A:—

<i>Sl.No</i>	<i>Nature of information</i>	<i>:</i>	<i>Details #</i>
(i)	Status (individual, company, firm etc.) of the assessee	:	
(ii)	Permanent Account Number or Aadhaar Number of the assessee if allotted	:	
(iii)	Nationality (in the case of an individual) or Country or specified territory of incorporation or registration (in the case of others)	:	
(iv)	Assessee's tax identification number in the country or specified territory of residence and if there is no such number, then, a unique number on the basis of which the person is identified by the Government of the country or the specified territory of which the assessee claims to be a resident	:	
(v)	Period for which the residential status as mentioned in the certificate referred to in sub-section (4) of section 90 or sub-section (4) of section 90A is applicable	:	
(vi)	Address of the assessee in the country or territory outside India during the period for which the certificate, mentioned in (v) above, is applicable	:	

2. I have obtained a certificate referred to in sub-section (4) of section 90 or sub-section (4) of section 90A from the Government of (name of country or specified territory outside India)

Signature:

Name:

Address:

Permanent Account Number or Aadhaar Number

Verification

I do hereby declare that to the best of my knowledge and belief what is stated above is correct, complete and is truly stated.

Verified today the day of.....

.....

Signature of the person providing the information

Place:

Notes :

1. *Delete whichever is not applicable.
2. #Write N.A. if the relevant information forms part of the certificate referred to in sub-section (4) of section 90 or sub-section (4) of section 90A.

ANNEXURE- DT2

We do not wholly or partly carry on business in the Republic of India through a Permanent Establishment in India. Further we do not constitute any Permanent Establishment in India in accordance with the Article No. 5 of the DTAA between India and _____ (Supplier country name)

We also declare No Significant Economic Presence (SEP) in India as per Indian IT Rule 11UD and self-declare that No-resident is eligible to obtain benefits of relevant DTAA between India and _____

We do not have a business connection¹ in the Republic of India as per Section 9(1)(i) of the Act.

As and whenever we will constitute / establish any Permanent Establishment/ business connection in India or deemed to have a Permanent Establishment / business connection in India or in case it is held by Indian Income Tax Authorities that we have a Permanent Establishment / business connection in India (referred as 'event'), we will bring this to the knowledge of Bharat Heavy Electricals Limited before any subsequent payments are released by Bharat Heavy Electricals Limited or within 5 working days of any such event, whichever is earlier.

We hereby declare that whatever is stated above is true and correct. In the event there is any change in any of the facts stated above, we will bring this to the knowledge of Bharat Heavy Electricals Limited before any subsequent payments are released by Bharat Heavy Electricals Limited or within 5 working days of any such event, whichever is earlier.

Where any tax, interest, penalty is levied on Bharat Heavy Electricals Limited for non/lower withholding of taxes on account of the above declarations being incorrect, we, Name of vendor , hereby undertake that we shall reimburse Bharat Heavy Electricals Limited such amounts as would be demanded by the Tax Authorities along with Interest and Penalty.

Explanation in foot mark

^{1 1} The term 'business connection' shall include significant economic presence ("SEP") of a non-resident in India, w.e.f. 1 April 2021. As per Explanation 2A to Section 9(1)(i) of the Act read with Notification no. 41 of 2021, SEP for this purpose, shall mean:- (a) transaction in respect of any goods, services or property carried out by a non-resident with any person in India including provision of download of data or software in India, for which aggregate payments

BRIEF PROCEDURE FOR CONDUCT OF CONCILIATION PROCEEDINGS

1. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided herein:
2. The party desirous of resorting to Conciliation shall send an invitation/notice in writing to the other party to conciliate specifying all points of Disputes with details of the amount claimed. The party concerned shall not raise any new issue thereafter. Parties shall also not claim any interest on claims/counter-claims from the date of notice invoking Conciliation till the conclusion of the Conciliation proceedings.
3. The party receiving the invitation/notice for Conciliation shall within 30 days of receipt of the notice of Conciliation intimate its consent for Conciliation along with its counter-claims, if any.
4. The Conciliation in a matter involving claim or counter-claim (whichever is higher) up to Rs 5 crores shall be carried out by sole Conciliator nominated by BHEL while in a matter involving claim or counter-claim (whichever is higher) of more than Rs 5 crores Conciliation shall be carried out by 3 Conciliators nominated by BHEL.
5. The Parties shall be represented by only their duly authorized in-house executives/officers and neither Party shall be represented by a Lawyer.
6. The first meeting of the IEC shall be convened by the IEC by sending appropriate communication/notice to both the parties as soon as possible but not later than 30 days from the date of his/their appointment. The hearings in the Conciliation proceeding shall ordinarily be concluded within two (2) months and, in exceptional cases where parties have expressed willingness to settle the matter or there exists possibility of settlement in the matter, the proceedings may be extended by the IEC by a maximum of further 2 months with the consent of the Parties subject to cogent reasons being recorded in writing.
7. The IEC shall thereafter formulate recommendations for settlement of the Disputes supported by reasons at the earliest

but in any case within 15 days from the date of conclusion of the last hearing. The recommendations so formulated along with the reasons shall be furnished by the IEC to both the Parties at the earliest but in any case within 1 month from the date of conclusion of the last hearing.

8. Response/modifications/suggestions of the Parties on the recommendations of the IEC are to be submitted to the IEC within time limit stipulated by the IEC but not more than 15 days from the date of receipt of the recommendations from the IEC.
9. In the event, upon consideration, further review of the recommendations is considered necessary, whether by BHEL or by the other Party, then, the matter can be remitted back to the IEC with request to reconsider the same in light of the issues projected by either/both the Parties and to submit its recommendations thereon within the following 15 days from the date of remitting of the case by either of the Parties.
10. Upon the recommendations by the Parties, with or without modifications, as considered necessary, the IEC shall be called upon to draw up the Draft Settlement Agreement in terms of the recommendations.
11. When a consensus can be arrived at between the parties only in regard to any one or some of the issues referred for Conciliation the draft Settlement Agreement shall be accordingly formulated in regard to the said Issue(s), and the said Settlement Agreement, if signed, by the parties, shall be valid only for the said issues. As regards the balance issues not settled, the parties may seek to resolve them further as per terms and conditions provided in the contract.
12. In case no settlement can be reached between the parties, the IEC shall by a written declaration, pronounce that the Conciliation between the parties has failed and is accordingly terminated.
13. Unless the Conciliation proceedings are terminated in terms of para 22 (b), (c) & (d) herein below, the IEC shall forward his/its recommendations as to possible terms of settlement within one (1) month from the date of last hearing. The date of first hearing of Conciliation shall be the starting date for calculating the period of 2 months.

14. In case of 3 members IEC, 2 members of IEC present will constitute a valid quorum for IEC and meeting can take place to proceed in the matter after seeking consent from the member who is not available. If necessary, videoconferencing may be arranged for facilitating participation of the members. However, the IEC recommendations will be signed by all members. Where there is more than one (1) Conciliator, as a general rule they shall act jointly. In the event of differences between the Members of IEC, the decision/recommendations of the majority of the Members of IEC shall prevail and be construed as the recommendation of the IEC.
15. The Draft Settlement Agreement prepared by the IEC in terms of the consensus arrived at during the Conciliation proceedings between the Parties shall be given by the IEC to both the parties for putting up for approval of their respective Competent Authority.
16. Before submitting the draft settlement agreement to BHEL's Competent Authority viz. the Board Level Committee on Alternative Dispute Resolution (BLCADR) for approval, concurrence of the other party's Competent Authority to the draft settlement agreement shall be obtained by the other party and informed to BHEL within 15 days of receipt of the final draft settlement agreement by it. Upon approval by the Competent Authority, the Settlement Agreement would thereafter be signed by the authorized representatives of both the Parties and authenticated by the members of the IEC.
17. In case the Draft Settlement Agreement is rejected by the Competent Authority of BHEL or the other Party, the Conciliation proceedings would stand terminated.
18. A Settlement Agreement shall contain a statement to the effect that each of the person(s) signing thereto (i) is fully authorized by the respective Party(ies) he/she represents, (ii) has fully understood the contents of the same and (iii) is signing on the same out of complete freewill and consent, without any pressure, undue influence.
19. The Settlement Agreement shall thereafter have the same legal status and effect as an arbitration award on agreed terms on the substance of the dispute rendered by an arbitral tribunal passed under section 30 of the Arbitration and Conciliation Act, 1996.

20. Acceptance of the Draft Settlement Agreement/recommendations of the Conciliator and/or signing of the Settlement Agreement by BHEL shall however, be subject to withdrawal/closure of any arbitral and/or judicial proceedings initiated by the concerned Party in regard to such settled issues.
21. Unless otherwise provided for in the agreement, contract or the Memorandum of Understanding, as the case may be, in the event of likelihood of prolonged absence of the Conciliator or any member of IEC, for any reason/incapacity, the Competent Authority/Head of Unit/Division/Region/Business Group of BHEL may substitute the Conciliator or such member at any stage of the proceedings. Upon appointment of the substitute Conciliator(s), such reconstituted IEC may, with the consent of the Parties, proceed with further Conciliation into the matter either de-novo or from the stage already reached by the previous IEC before the substitution.
22. The proceedings of Conciliation under this Scheme may be terminated as follows:
- On the date of signing of the Settlement agreement by the Parties; or,
 - By a written declaration of the IEC, after consultation with the parties, to the effect that further efforts at conciliation are no longer justified, on the date of the declaration; or,
 - By a written declaration of the Parties addressed to the IEC to the effect that the Conciliation proceedings are terminated, on the date of the declaration; or,
 - By a written declaration of a Party to the other Party and the IEC, if appointed, to the effect that the Conciliation proceedings are terminated, on the date of the declaration.
 - On rejection of the Draft Settlement Agreement by the Competent Authority of BHEL or the other Party.
23. The Conciliator(s) shall be entitled to following fees and facilities:

Sl No	Particulars	Amount
1	Sitting fees	Each Member shall be paid a Lump Sum fee of Rs 75,000/- for the whole case payable in terms of paragraph No. 27 herein below.
2	Towards drafting of settlement agreement	In cases involving claim and/or counter-claim of up to Rs 5crores. Rs 50,000/- (Sole Conciliator)

Sl No	Particulars	Amount
		<p>In cases involving claim and/or counter-claim of exceeding Rs 5 crores but less than Rs 10 crores. Rs 75,000 (per Conciliator) In cases involving claim and/or counter-claim of more than Rs 10 crores. Rs 1,00,000/- (per Conciliator)</p> <p>Note: The aforesaid fees for the drafting of the Settlement Agreement shall be paid on Signing of the Settlement Agreement after approval of the Competent Authority or Rejection of the proposed Settlement Agreement by the Competent Authority of BHEL.</p>
3	Secretarial expenses	<p>Rs 10,000/- (one time) for the whole case for Conciliation by a Sole Member IEC.</p> <p>Where Conciliation is by multi member Conciliators –Rs 30,000/- (one time)- to be paid to the IEC</p>
4	<p>Travel and transportation and stay at outstation</p> <p>i) Retired Senior Officials of other Public Sector Undertakings (pay scale wise equivalent to or more than E-8 level of BHEL)</p> <p>Others</p>	<p>As per entitlement of the equivalent officer (pay scale wise) in BHEL.</p> <p>As per the extant entitlement of whole time Functional Directors in BHEL.</p>

Sl No	Particulars	Amount
		Ordinarily, the IEC Member(s) would be entitled to travel by air Economy Class.
5	Venue for meeting	Unless otherwise agreed in the agreement, contract or the Memorandum of Understanding, as the case may be, the venue/seat of proceedings shall be the location of the concerned Unit / Division / Region / Business Group of BHEL. Without prejudice to the seat/venue of the Conciliation being at the location of concerned BHEL Unit / Division / Region / Business Group, the IEC after consulting the Parties may decide to hold the proceedings at any other place/venue to facilitate the proceedings. Unless, Parties agree to conduct Conciliation at BHEL premises, the venue is to be arranged by either Party alternately.

24. The parties will bear their own costs including cost of presenting their cases/evidence/witness(es)/expert(s) on their behalf. The parties agree to rely upon documentary evidence in support of their claims and not to bring any oral evidence in IEC proceedings.
25. If any witness(es) or expert(s) is/are, with the consent of the parties, called upon to appear at the instance of the IEC in connection with the matter, then, the costs towards such witness(es)/expert(s) shall be determined by the IEC with the consent of the Parties and the cost so determined shall be borne equally by the Parties.
26. The other expenditures/costs in connection with the Conciliation proceedings as well as the IEC's fees and expenses shall be shared by the Parties equally.
27. Out of the lump sum fees of Rs 75,000/- for Sitting Fees, 50% shall be payable after the first meeting of the IEC and the remaining 50% of the Sitting Fees shall be payable only after

termination of the conciliation proceedings in terms of para 22 hereinabove.

28. The travelling, transportation and stay at outstation shall be arranged by concerned Unit as per entitlements as per Serial No. 3 of the Table at para 23 above, and in case such arrangements are not made by the BHEL Unit, the same shall be reimbursed to the IEC on actuals limited to their entitlement as per Serial No. 4 of the Table at Para 23 above against supporting documents. The IEC Member(s) shall submit necessary invoice for claiming the fees/reimbursements.
29. The Parties shall keep confidential all matters relating to the conciliation proceedings. Confidentiality shall extend also to the settlement agreement, except where its disclosure is necessary for purposes of its implementation and enforcement or as required by or under a law or as per directions of a Court/Governmental authority/ regulatory body, as the case may be.
30. The Parties shall not rely upon or introduce as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the Disputes that is the subject of the Conciliation proceedings:
 - a. Views expressed or suggestions made by the other party in respect of a possible settlement of the Disputes;
 - b. admissions made by the other party in the course of the Conciliator proceedings;
 - c. proposals made by the Conciliator;
 - d. The fact that the other Party had indicated his willingness to accept a proposal for settlement made by the Conciliator.
31. The Parties shall not present the Conciliator(s) as witness in any Alternative Dispute Resolution or Judicial proceedings in respect of a Disputes that is/was the subject of that particular Conciliation proceeding.
32. None of the Conciliators shall act as an arbitrator or as a representative or counsel of a Party in any arbitral or judicial proceeding in respect of a Disputes that is/was the subject of that particular Conciliation proceeding.
33. The Parties shall not initiate, during the Conciliation proceedings, any arbitral or judicial proceedings in respect of a Disputes that is the subject matter of the Conciliation

proceedings except that a Party may initiate arbitral or judicial proceedings where, in his opinion, such proceedings are necessary for preserving his rights including for preventing expiry of period of limitation. Unless terminated as per the provisions of this Scheme, the Conciliation proceedings shall continue notwithstanding the commencement of the arbitral or judicial proceedings and the arbitral or judicial proceedings shall be primarily for the purpose of preserving rights including preventing expiry of period of limitation.

34. The official language of Conciliation proceedings under this Scheme shall be English unless the Parties agree to some other language.

**FORMAT FOR SEEKING CONSENT FOR REFERRING THE DISPUTES
TO CONCILIATION THROUGH IEC**

To,

M/s. (Stakeholder's name)

Sub: Resolution of the Disputes through conciliation by Independent Expert Committee (IEC).

Ref: Contract No/MoU/Agreement/LOI/LOA& date _____.

Sir,

With reference to above referred Contract/MoU/Agreement/LOI/LOA, you have raised certain Disputes/claims. Vide your letter dated____ you have requested BHEL to refer the Disputes/claims to IEC for Conciliation.

We are enclosing herewith Format (3) for giving consent and the terms and conditions of BHEL Conciliation Scheme, 2018 governing conciliation through IEC. You are requested to give your unconditional consent to the said terms and conditions of the Scheme by returning the same duly sealed and signed on each page. On receipt of your consent, matter will be put to the Competent Authority for consideration and decision.

Please note that BHEL has also certain claims against you (if applicable). BHEL reserves its right to agree or not to agree conciliation of the said disputes through BHEL and this letter is being issued without prejudice to BHEL's rights and contentions available under the contract and law.

Yours faithfully,

Representative of BHEL

**FORMAT FOR GIVING CONSENT BY
CONTRACTOR/VENDOR/CUSTOMER/COLLABORATOR/CONSORTIUM PARTNERS FOR REFERRING THE DISPUTES TO CONCILIATION
THROUGH IEC**

To,

BHEL

.....

Sub: Resolution of Disputes through Conciliation by Independent Expert Committee (IEC).

Ref: Contract/MoU/Agreement/LOI/LOA No _____ & date_____

With reference to above referred contract, our following bills/invoices/claims submitted to BHEL are still unpaid giving rise to Disputes:

SL. no.	Claim Description	Bill submitted to BHEL (no. and date)	Amount of the bill/claim	Amount received from BHEL	Outstanding Amount

Accordingly we request you to kindly refer the Disputes in respect of above claims to IEC for Conciliation.

We hereby agree and give our unconditional consent to the terms and conditions of BHEL Conciliation Scheme, 2018 governing conciliation through IEC. We have signed the same on each page and enclosed it for your consideration.

Yours faithfully,

(Signature with stamp)

**Authorized Representative of Contractor
Name, with designation
Date**

STATEMENT OF CLAIMS/COUNTER CLAIMS TO BE SUBMITTED TO THE IEC BY BOTH THE PARTIES

1. Chronology of the Disputes
2. Brief of the Contract/MoU/Agreement/LOI/LOA
3. Brief history of the Disputes:
4. Issues:
5. Details of Claim(s)/Counter Claim(s):

SI. No.	Description of claim(s)/Counter Claim	Amount (in INR)Or currency applicable in the contract	Relevant contract clause

6. Basis/Ground of claim(s)/counter claim(s) (along with relevant clause of contract)

Note– *The Statement of Claims/Counter Claims may ideally be restricted to maximum limit of 20 pages. Relevant documents may be compiled and submitted along with the statement of Claims/Counter Claims. The statement of Claims/Counter Claims is to be submitted to all IEC members and to the other party by post as well as by email.*

PART-I (No Deviation Certificate)

Note: The following Declaration to be submitted on the bidder's Letter Head, duly signed & stamped and to be attached along with your Technical bid of the tender.

===== **Design, Manufacturing and supply of SCR Dedusting System for Panki SCR Project and Supervision of Erection & Commissioning.** =====

Enquiry No.: **1802300046 dated 16.09.2023**

I/We M/s. have read and clearly understood all the Terms and conditions in Tender Schedule of and accordingly accept the same without any deviation what so ever.

- I/ We unconditionally agree to all the tender conditions and no new conditions are imposed by us in the technical / price bid. I understand in the event of imposing any condition in the technical / price bid, such condition would be ignored by BHEL and only the prices will be considered for the purpose of evaluation". In case of any deviation (Technical or commercial) the same is mentioned below.*

SPECIFICATION	1. Introduction on De-dusting system (Ref. DDS/INTR) 2. Specification TSR:006 Ash sweeper system/01. 3. Specification TSR:007 Sonic horns system/01. 4. P&ID of SCR reactor: 0-SC-288-90001. 5. SCR Reactor arrangement: 1-SR-000-00004. 6. P&ID for Ash Sweeper system (TP Details) :3-SR-500-00075. 7. P&ID for Sonic horn system (TP Details) :3-SR-500-00076. 8. De-Dusting system guarantee: SCR/DD/PG/001. 9. Valve schedule :SCR/1728/VALVE/001. 10. P&ID of Catalyst De-dusting System: 0-SR-056-00022	
DOC. REFERENCE	BHEL ENQ. CALLED FOR	FIRM'S ALTERNATE OFFER

- I/ We confirm that none of our group concern or affiliates etc., appears on the list of banned firms / companies by BHEL (list available on www.bhel.com) nor any of the Director / Partner / proprietor of bidder / such group concern or affiliate etc. are involved with such company.*
- I/ We also declare that, we have not been suspended or black listed or issued with Show Cause Notice by BHEL- Trichy or any other BHEL Unit or any PSU/ Government organization.*
- I/ We confirm that other than us, none of our group concerns or affiliates etc. are participating in the tender either directly or indirectly through any other agency under same proprietor / common director(s) / common partner(s).*
- I/ We confirm that if any of the above statement / information furnished by us in this tender is found to be false/ fake at any stage of tender evaluation or during execution of contract, BHEL will have the right to initiate appropriate action including legal proceeds / termination of contract, recovery of damages, penalties etc. as deemed fit.*

(Contractor Signature with Seal)

Contractor Signature

Contractor Seal

/ On Bidder's office letter pad /

Self-Declaration

Enquiry No.	1802300046
Enquiry Date	16.09.2023

In line with Government public procurement order Number P-45021/2/2017-B.E-II dated 15.06.2017, and further modified order dt. 28.05.2018 and 04.06.2020.

I / We hereby declare that I / We are a "Local Supplier" meeting the requirement of minimum local content (.....%) defined in the above government notification for the goods against above mentioned enquiry Number.

Details of location at which local value addition will be made is as follows:

Door No.	
Street / Address 1	
Street / Address 2	
District	
State	
Country	
PIN Code	

We also understand that the false declarations will be considered as breach of Integrity and liable for action.

For Company Name:

Seal:

Signature:

Date:

Place:

(Please fill all the yellow color field)

BANK GUARANTEE FOR PERFORMANCE SECURITY

(Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s))

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

IFSC AND MICR CODE

Dear Sirs,

1. 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) (VENDOR CODE) 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.....dated³ valued at Rs.....⁴ (Rupees -----)/FC.....(in words.....) for⁵ (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,

2. 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.

3. 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. _____.

4. 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.

5. 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.

6. We thebank 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.

7. 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.

8. 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.

9. 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.

10. 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.

11. Unless a demand or claim under this guarantee is made on us in writing on or before the⁸we shall be discharged from all liabilities under this guarantee thereafter.

12. Any claim or dispute arising under the terms of this document shall only be enforced or settled in the Courts at Tiruchirappalli.

13. 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 to⁷
- c) Unless the Bank is served a written claim or demand on or before (minimum 3 to 6 months from the expiry date 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.

14. 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.....

BANK EMAIL ID:

BANK PHONE NO:

AUTHORISED SIGNATORIES CELL PHONE NO:

BANK FAX NO:

¹ NAME AND ADDRESS OF EMPLOYER I.e Bharat Heavy Electricals Limited

² NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ CONTRACT VALUE

⁵ PROJECT/SUPPLY DETAILS

⁶ BG AMOUNT IN FIGURES AND WORDS

⁷ VALIDITY DATE

⁸ DATE OF EXPIRY OF CLAIM PERIOD

List of Consortium Banks	
Sl. No.	Name of the bank
1.	State Bank of India
2.	Canara Bank
3.	Axis Bank
4.	Bank of Baroda
5.	Central bank
6.	Citi Bank N.A.
7.	Deutsche Bank
8.	Exim Bank
9.	Federal Bank Limited
10.	HDFC Bank Limited
11.	Hongkong and Shanghai Banking Corporation Limited
12.	Indian Bank
13.	ICICI Bank Limited
14.	IDBI Bank Limited
15.	IndusInd Bank Limited
16.	Indian Overseas Bank
17.	Kotak Mahindra Bank Limited
18.	Punjab National Bank
19.	RBL Bank Ltd.
20.	Standard Chartered Bank
21.	Union Bank of India
22.	Yes Bank Limited

THIRD PARTY NON-DISCLOSURE AGREEMENT

I, _____, on behalf of the _____ (Name of Company), acknowledge that the information received or generated, directly or indirectly, while working with BHEL, Trichy on contract is confidential and that the nature of the business of the BHEL, Trichy is such that the following conditions are reasonable, and therefore:

I warrant and agree as follows:

I, or any other personnel employed or engaged by our company, agree not to disclose, directly or indirectly, any information related to the BHEL, Trichy Without restricting the generality of the foregoing, it is agreed that we will not disclose such information consisting but not necessarily limited to:

- Technical information: Methods, drawings, processes, formulae, compositions, systems, techniques, inventions, computer programs/data/configuration and research projects.
- Business information: Customer lists, project schedules, pricing data, estimates, financial or marketing data,

On conclusion of contract, I, or any other personnel employed or engaged by our company shall return to BHEL, Trichy all documents and property of BHEL, Trichy, including: drawings, blueprints, reports, manuals, computer programs/data/configuration, and all other materials and all copies thereof relating in any way to BHEL, Trichy's business, or in any way obtained by me during the course of contract. I further agree that I, or any others employed or engaged by our company shall not retain copies, notes or abstracts of the foregoing.

This obligation of confidence shall continue after the conclusion of the contract also.

I acknowledge that the aforesaid restrictions are necessary and fundamental to the business of the BHEL, Trichy and are reasonable given the nature of the business carried on by the BHEL, Trichy I agree that this agreement shall be governed by and construed in accordance with the laws of country.

I enter into this agreement totally voluntarily, with full knowledge of its meaning, and without duress.

Place:- _____

Date:- _____

Name

Company

Signature

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) departments officials whose contact details are provided below.

Details of contact person(s): -

(1)

Name: Rajesh Kummar SB

Deptt: MM/BOI

Address: 24 Building, BHEL, Trichy

Phone: 0431-2574166

Email: sbrajesh@bhel.in

(2)

Name: Jiby MJ

Deptt: MM/BOI

Address: 24 Building, BHEL, Trichy

Phone: 0431-2574363

Email: mjjiby@bhel.in

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 _____

Design, Manufacturing and supply of SCR Dedusting System and Supervision of Erection & Commissioning for Panki project _____ (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)/ Contractor (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 Principal 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.

SBRajeshk

S.B. RAJESH KUMMAR
 Senior Engineer Dy. Mgr
 MM / Purchase / BOI
 BHEL, TRICHY - 620 014.
 (Office Seal)

For & On behalf of the Principal

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

Place Trichy
 Date 31.08.2023

Witness: *JIBY-M-J*
 (Name & Address) Dy. ENGR,
MM/BOI, BHEL TRICHY

Witness: _____
 (Name & Address) _____

Annexure-B

Technical Pre-Qualification Requirement (PQR) for

SCR De-Dusting System

1. The vendor shall be an established SCR De-Dusting system supplier having adequate Engineering, Manufacturing, testing and servicing facilities and shall furnish technical backup documents in proof for above requirements.

Offers from authorized representative/dealer of OEM is also acceptable. However, the above said conditions shall apply for the OEM. Such representative/dealer of OEM shall submit the below mentioned documents in addition to those mentioned in clause 6 as a proof of representation of OEM:

- a. Authorization letter indicating the division of work and undertaking for the guarantee of offered system from the OEM.
- b. Dealership certificate (in case of dealer)
- c. Business dealing agreement.

2. The vendor shall have experience of having supplied De-Dusting system for high dust application as per the technical specification for SCR plants or application of similar severity. Supply reference list with details of PO, PO date, customer name, and application shall be submitted.
3. The De-Dusting system offered shall be from the existing regular supply range of the vendor. Vendor shall provide the product catalogue.
4. Proven track record is required. Minimum One end user certificate for the satisfactory operational performance of their product supplied meeting requirements specified in enquiry specification or greater.

(OR)

Successfully executed two POs for similar item meeting requirements specified in enquiry specification or greater.

Vendor to submit the corresponding datasheets / drawings / technical documents of supplied item as per end user certificate/POs.

5. In case of ordering, the Vendor shall have the responsibility for the following and same to be confirmed point wise.
- i) Vendor should have the component replacement responsibility in case of defect / failure.
 - ii) Experts from Vendor's side shall associate in commissioning activities at site, if required.
 - iii) Vendor should ensure the product performance during erection & commissioning and ensure performance guarantee.
6. Backup document checklist to meet PQR to the fullest satisfaction of BHEL..

Clause	Documents acceptable	Check list
1	i) ISO or Other third Party certification about the engineering, manufacturing, testing and servicing facilities in the name of supplier/OEM as applicable. The certificate shall be specific for the product quoted by the vendor. ii) List of manufacturing, testing and servicing facilities available (like machinery/equipment) in the letterhead of supplier/OEM as applicable.	<input type="checkbox"/>
1	Auth. Letter, Dealership cert., Business dealing agreement(in case of representative/dealer)	<input type="checkbox"/>
2	Supply reference list with details of PO, PO date, customer name, application severity/type in the form of a table	<input type="checkbox"/>
3	Product Catalogue in the name of supplier/OEM as applicable	<input type="checkbox"/>
4	Min. one end user certificate (or) Two POs in the name of supplier/OEM as applicable	<input type="checkbox"/>
5	Signed copy of this technical PQR document	<input type="checkbox"/>

**OEM signature and seal with Date
(If applicable)**

Vendor signature and seal with Date

ANNEXURE-C

Financial Soundness:

1. Indigenous suppliers shall submit Audited copies of annual reports (Balance Sheets), Profit & Loss statement for the last three years (or from date of incorporation whichever is less) and GST certificate.
2. In case of authorized representative/dealer of OEM participating in the tender, all the documents as per Sl. No.1 above shall be submitted for both the authorized representative/dealer and OEM.
3. Import suppliers shall submit latest report from reputed third party business rating agency like D&B /Credit reform etc.

**OEM signature and seal with Date
(If applicable)**

Vendor signature and seal with Date

INTRODUCTION ON DE-DUSTING SYSTEM

1. INTRODUCTION.

- a. In boiler combustion process emissions are by products. Emission of nitrogen oxides from combustion is a major environmental concern. Nitrogen oxides from the combustion are collectively termed as NO_x.
- b. **SCR system** has been installed into the flue gas stream of the steam generator for the reduction of NO_x. SCR System utilize a catalyst to convert NO_x in the flue gas to elemental Nitrogen by using ammonia as a reagent.
- c. Ash accumulation over the catalyst layers leads to reduction of catalyst efficiency and thereby decrease the amount of NO_x reduction. Catalyst de-dusting system installed on the reactor wall over the catalyst module to eliminate the ash accumulation. De-dusting system mainly consists of sonic horns and ash sweepers/air canon/air blasters, which are meant for the removal of ash accumulation from the catalyst module layers of SCR.
- d. Sonic horns and ash sweepers are installed on the top of each reactor catalyst layer.
- e. ***Refer the drawing "SCR REACTOR ARRANGEMENT" for catalyst module arrangement and dedusting equipments arrangements.***

2. SONIC HORN SYSTEM.

- a) Resonating low frequency, high-energy sonic horns are used to clean the particulate build-up on the catalyst surface in the selective catalytic reduction (SCR) reactors.
- b) The purpose of the sonic horns is to dislodge ash from the surface of the catalyst by causing particles to resonate at a frequency of about 50 to 75 Hz. The ash is then carried away from the catalyst and out of the reactor by the flue gas stream. Accumulation of fly ash on the surface of the catalyst will reduce the efficiency of the catalyst and increase the pressure drop across the catalyst.
- c) The sonic horn system is required to operate whenever flue gas is flowing through the SCR reactor. Sonic horns operate in groups. The Air receiver, duplex filter and flow measurement has been considered for Sonic horn system.
- d) ***Refer technical specification TSR 007 and its datasheet for complete requirement of sonic horns and its quantity.***

3. Ash Sweeper System.

- a) Ash Sweepers are a type of air cannons used to control SCR reactor ash accumulation. Unlike sonic horns, ash sweepers use a nozzle to direct a blast of compressed air horizontally over the catalyst screen. The resultant surge of air, dislodges particles allowing the flue gas to transport ash to the SCR reactor outlet and downstream particulate control systems.
- b) Each ash sweeper is equipped with a dedicated in-line solenoid operated valve that controls the air supply and the charging and discharging cycle.
- c) The ash sweepers use compressed air supplied through the shared sonic horn air supply system. The ash sweeper air supply lines are tied to the main air supply header downstream of the air receiver, duplex filter and flow measurement.
- d) Refer technical specification TSR 006 and its datasheet for complete requirement of ash sweeper and its quantity.**

BHARAT HEAVY ELECTRICALS LIMITED

TIRUCHIRAPPALLI-620 014

Fuel Systems/PE(FB)



Technical Purchase Specification for
ASH SWEEPER SYSTEM

Specification No.: **TSR:006**

Revision No.: 01

<i>Rev. No.</i>	<i>Rev. Date</i>	<i>Clause</i>	<i>Description</i>	<i>Checked</i>	<i>Approved.</i>
01	30.07.21	-	General Revision	VSN	GSK

	<i>Name</i>	<i>Signature</i>	<i>Date</i>
<i>Prepared</i>	Preetam kumar	-Sd-	04.09.2019
<i>Checked</i>	V Shankar Naik	-Sd-	05.09.2019
<i>Approved</i>	G. Saravanakumar	-Sd-	07.09.2019



Specification for ASH SWEEPER SYSTEM

TSR:006
Revision No.:01

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2 Technical Specification

2.1 Scope

This specification defines the minimum requirements for the design, manufacture, testing, preparation for shipment and delivery of materials and engineering documentation and start-up service (support for erection and commissioning) for this equipment. Supplier is solely responsible for correct design, engineering, and supply of their scope of supply.

The offering, based on recommendations from the Supplier, shall employ Ash Sweepers located as mutually established so as to avoid major stiffeners and structure but so as to effectively clean the entire cross section area and volume of each catalyst level so equipped.

In the event of conflicts between codes, standards, and this specification, customer specification of this document, the more stringent requirements shall apply and the conflict between these specifications shall be submitted to BHEL in writing and should obtain BHEL's prior approval.

2.2 Equipment, Materials and Services by Supplier

The Supplier's scope of supply includes, but is not necessarily limited to:

- a. Ash Sweeper system utilizing plant compressed air to clean the top of each catalyst layer for each SCR reactor; ***This specification indicates the minimum quantity of ash sweepers, if any additional requirement of ash sweepers to meet the process parameters vendor to be taken care at their end.***
- b. Equipment and ancillaries as defined in datasheets of Ash Sweeper Selection, P&ID's, and General Arrangement Drawings of this document.
- c. Supplier shall include mounting plates/rings or tubes (as required, one for each Ash Sweeper), pre-drilled and tapped and/or weld-prepped, with all required fasteners and hardware. **No welding to the ash sweepers is permitted.** Blanking plates for ash sweepers of future layers are to be supplied by the vendor.
- d. An ASME pressure vessel, relief valve, piston valve assembly, high temperature nozzle **preferably fan jet nozzle**, aircraft grade safety cable, Solenoid valve, mounting plates/ rings tubes pre-drilled and tapped, fasteners and two flexible hoses for each ash sweeper, blanking plates for ash sweepers of future layers.
- e. Drawings and documents showing loads, forces, centres of gravity (pick points), required structural bracing, and other technical details necessary for a safe, robust installation



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- f. Operating procedure explaining ash sweeper operational practice and suggested sequence manuals and instructions for storage, installation, commissioning, operating and maintenance.
- g. Equipment datasheets, completely filled by the Supplier, in order to inform BHEL as to the specifics of the equipment being supplied.
- h. Special tools required; For example, if a special lifting device is required during shop fabrication or handling, the device must be available on the construction site for installing that piece of equipment.
- i. Schedule for specific deliverables and required dates.
- j. De dusting system Erection drawings with BOM.
- k. Ash sweeper system design shall include compressed air supply piping routing and DCS controls for all ash sweeper including future layer ash sweepers with the initial design itself to facilitate future tie-in for the spare catalyst layer. Receiver tank, fasteners, valves and other accessories required for the future layer shall be designed and supplied for this specification. Supplier to design and supply equipment in full where in only future layer ash sweepers will be ordered to make the system complete. ***Detailed BOM of piping shall be furnished by the supplier based on which piping shall be supplied by BHEL.***

2.3 Equipment, Materials and Services by Others

The scope of supply by others shall be:

- Unloading and storage at site
- Installation Testing, field performance monitoring, and inspections (Supplier to witness and assist as necessary)
- Utility systems piping up to terminal point
- Monorails and hoists
- ***Compressed air interconnecting piping to the Supplier's supplied equipment up to terminal point***
- Structural support steel
- Insulation
- Electrical wiring, conduits, trays, push buttons and starters external to Supplier supplied equipment.
- DCS controls and remote alarms
- Instruments PG/PI, PIT/PT's and PDT/PDIT's are in BHEL scope as marked by terminal points and shown in P&ID for sonic horn system in reference drawings.
- Ash sweepers in Future layer

2.4 Performance Guarantees

The equipment provided by the Supplier shall operate in accordance with the performance data in the datasheet(s) included herewith.



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The equipment shall meet all applicable codes and standards requirements.

BHEL and/or Owner may conduct field tests during start up and after commercial operation of the installation for a period determined by the terms and conditions of purchase.

Total air consumption rate (including that of sonic horn) shall not exceed the instantaneous and averaged hourly rates as specified by the supplier as per guarantee clause No.05.

The Supplier shall fully cooperate with BHEL and Owner in defining a system test procedure.

This test procedure shall consider individual ash sweeper performance, grouped or otherwise, both in the cold SCR and hot flue gas conditions. Monitoring of SCR system pressure drop criteria shall be determined in advance. Catalyst surface cleanliness criteria shall be determined based on SCR operating procedures and observations of dust accumulation accounting for operating time and fuels being fired. The Supplier's test procedure shall be mutually agreed upon by the concerned parties including, but not limited to, Supplier, BHEL and Owner, and Owner's Engineer.

The System must ensure operational cleanliness and performance of the SCR catalyst without any damage or deterioration of the catalyst and its ancillary equipment.

2.5 Detailed Requirements of Equipment

2.5.1 General

The SCR reactor is designed and operated with flue gas having high dust concentrations.

The flue gas conditions and fuel data for the resultant ash/dust, etc. are as defined in the specifications included in Sections 5 clause 5.2 of TSR:007.

Air discharge shall be by piston valves controlled by solenoid valves. A spring return shall aid in piston closure and sealing after discharge.

The design shall prevent the ash sweeper from accidentally operating as a result of an abnormal drop in supply air pressure.

Each ash sweeper shall include an isolation slide gate installed in the blow pipe and an aircraft grade safety cable to prevent the pressure vessel from falling further than 1.5 meters should it become detached from the nozzle or blow pipe.



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Supplier shall include mounting plates/rings or tubes (as required, one for each Ash Sweeper), pre-drilled and tapped and/or weld-prepped, with all required fasteners and hardware. No welding to the ash sweepers is permitted. Blanking plates for ash sweepers of future layers.

Supplier must provide Material Safety Data Sheets (MSDS) for all coatings, paints, lubricants, preservatives, or chemicals that will be brought onto site by the Supplier for whatever reason. The MSDS must be submitted before equipment is delivered on the site.

Piping material shall be stainless steel as per ASTM A312 Gr304. Detailed BOM of piping shall be furnished by the supplier based on which piping shall be supplied by BHEL.

Supplier shall provide a detailed description of any special lifting and/or installation requirements.

2.5.2 System Air Supply

In order for the Ash Sweeper System to operate properly and safely under normal and expected conditions, the Supplier shall provide BHEL with complete data for the requirements of the Air Supply (see also datasheets in Section 5, to be completed by Supplier):

- Required air pressure (Kg/cm²(g))
- Required air flow rate during normal operation of the Ash Sweeper System (Nm³/hr)
- Acceptable moisture limit in the air supply. Vendor shall note the quality of service air requirement as per annexure and has to supply required equipment to handle the said service air quantity.
- Acceptable range of oil and particulate material
- Measures needed to avoid freezing, damage, or failure of the System

2.5.3 Instrumentation and Controls

Supplier shall provide necessary details & write up for integration of controls into the BHEL/ Owner's DCS. Ash Sweeper operation shall be synchronized with that of the sonic horn system. Instruments and controls must be sourced from suppliers on the Owner's Approved Suppliers List.

2.6 Industry Reference Documents (Codes and Standards)

At a minimum, all work performed and materials provided by the Supplier must be in accordance with all applicable Centre, State and local laws, ordinances, and regulations.



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The equipment will comply with the applicable portions of the following Codes and Standards.

The applicable revision of each of these Codes and Standards will be the current edition with addenda or the edition adopted by the controlling jurisdiction at the time of the purchase order.

In the event of a conflict between these documents and the specification, the Supplier shall submit a written request for an interpretation by BHEL. In general, the most stringent requirement shall govern.

Following are few standards.

- American National Standard Institute (ANSI)
- American Society of Testing and Materials (ASTM)
- American Society of Mechanical Engineers (ASME)
- American Petroleum Institute (API)
- Air Moving & Control Association (AMCA)
- Environmental Protection Agency (EPA)
- Institute of Electrical and Electronic Engineers (IEEE)
- Insulated Power Cable Engineers Association (IPCEA)
- International Organization for Standardization (ISO)
- Steel Structures Painting Council (SSPC)
- National Electrical Code (NEC)
- National Electrical Safety Codes (NESC)
- National Electrical Manufacturer's Association (NEMA)
- National Fire Protection Agency (NFPA)
- American Welding Society (AWS)
- American Institute of Steel Construction (AISC)
- Occupational Safety and Health Administration (OSHA)
- Joint Industrial Conference (JIC)
- Instrument Society of America (ISA)
- Bureau of Indian Standards (IS)

2.7 Operating procedure / duration

A operating procedure shall be provided by the Supplier to define the operating parameters of the system including the function of each piece of equipment, sounding intervals/durations, control devices, and instrumentation. This narrative shall form a basis to instruct and train plant personnel.

Precise P&ID's, and complete equipment/system operating and maintenance instructions/manuals provided in accordance with this specification shall complement this narrative.

2.8 Surface Preparation and Painting

As Per Manufacturer's Standard for outdoor installation and painting as applicable to project.



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2.9 Tagging Requirements

Mechanical equipment, motors, electrical equipment, control panels, valves, and instruments shall be tagged.

2.10 Field Service

At the request of BHEL, Supplier shall furnish a Field Engineer to provide technical assistance during construction/installation and commissioning.

BHEL will give Supplier sufficient notice prior to the site requirement for field service. Supplier stipulations that require a field service engineer or technician, such as inspection prior to equipment start up, shall be indicated in writing.

2.11 Spare Parts

Supplier shall include Start-up spare parts in the base pricing.

Supplier shall provide an option price for 5-year operating spare parts.

Supplier must supply a Start-up Spare Parts List and a 5-year Operating Spare Parts list in Excel format.

2.12 Documents to be submitted along with the offer

- a) Filled in data sheets
- b) Point wise compliance to the specification
- c) Deviations to the specification (if any) shall be clearly spelt out in detail.
- d) Overall dimensional assembly drawing for the selected variant along catalogues, drawings and O&M manuals.
- e) Cross sectional drawing with parts and materials identified with ash sweeper assembly details.
- f) Full designation with description of the designation codes for the selected variant.
- g) Relief valve dimensional drawing, data sheet and selection criteria.

2.13 Documents to be submitted after placement of order

Following documents shall be submitted along with the supplies.

- a) Functional write up
- b) Equipment training manual
- c) O&M instruction in soft version
- d) Dimensional drawing
- e) Cross section drawing with material identification and ash sweeper assembly details and Data sheets



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- f) Erection drawings along with BOM clearing all the interferences in boiler and SCR for BHEL review. BHEL will provide necessary General arrangement and floor plan drawings for preparation of erection drawings.

2.14 Packing

- All opening shall be firmly capped against ingress of water or dust.
- Shall be seaworthy packed in wooden boxes with water proof under cover for export jobs and road worthy packing for inland jobs.
- Liberal packing material & struts shall be used to arrest rolling & to protect from transit damages.

2.15 Marking

Stainless steel name plates with following boldly engraved shall be firmly fixed to the body with Maker's name & production serial number, tag number and Ash sweeper designation.

2.16 Guarantee

Vendor shall guarantee for design & manufacturing defects for a period of 12 months from the date of commissioning or 18 months from the date of supply whichever is earlier.

Vendor shall guarantee the performance of the de dusting system as per Clause 2.4 of this specification and annexure De-dusting system/performance guarantee.

3 Attachments and Reference Documents

3.1 Datasheets

Document No.	Description
Refer 5.0	Ash Sweeper selection
	Flue Gas Conditions (attached along with TSR:007)

3.2 Reference Drawings

Refer enclosures

4 Customer Specifications, Attachments, and Reference Documents

4.1 Customer Specifications & data sheets

Nil

4.2 Reference Drawings

Nil



Specification for
ASH SWEEPER SYSTEM

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5 Ash Sweeper selection and Datasheet

		ASH SWEEPER SELECTION	
		Owner / Client: UPRVUNL	Customer Number: 1728
Confidential	Data Revision Date	Plant: PANKI TPP	Datasheet
	...	Unit No: #1	
See NOTICE below	...	Location: Panki, Kanpur, Uttar Pradesh	
<p>NOTICE: This document and the information, design, and material contained and/or illustrated herein (hereinafter "proprietary material"), is the property of COMPANY and is submitted, lent, and furnished to recipient in strict confidence with the express understanding that the recipient shall not reproduce, copy, loan, dispose of, or disclose to anyone outside recipient's organization, directly or indirectly, or use said proprietary material for any purpose other than that for which it is furnished and submitted by COMPANY. Recipient by receiving said proprietary material agrees to these terms, not to use the proprietary material in any way injurious to the interests of COMPANY, and to return the same upon request by COMPANY.</p>			

5.1	GENERAL INFORMATION	
5.1.1	Equipment Name:	Ash Sweeper System
5.1.2	Quantity (For the boiler)	84 (Present) \$ + 28 (Future) #
5.1.3	Tag Number(s):	AS#1 to AS# 84 \$
5.1.4	Indoor/Outdoor:	Outdoor
	REFERENCE DOCUMENTS	
5.1.5	P&ID for ash sweeper system	3-SR-500-00075
5.1.6	P&ID of SCR reactor system	0-SC-288-90001
5.1.7	SCR reactor arrangement for de dusting system	1-SR-000-00004
5.1.8	P&ID for sonic horn system	3-SR-500-00076
5.1.9	Valve list	SR/1728/VALVE/001

Provision for future is required including valves, pipes and necessary accessories making the system complete except ash sweepers.

\$ - Vendor to Confirm

5.2	PERFORMANCE DATA	Units	Value / unit
	Number of Units	No.	1
5.2.1	Number of reactors per unit	No.	2
5.2.2	Reactor designations per unit	-	A,B
5.2.3	Number of levels of ash sweepers per reactor	No.	4 (3 Present +1 Future)
5.2.4	Number of ash sweepers per level per reactor	No.	14\$
5.2.5	Total number of ash sweepers per reactor	No.	Present : 42\$ + Future :14\$
5.2.6	Total of ash sweepers per unit	No.	Present : 84\$ + Future :28\$



**Specification for
ASH SWEEPER SYSTEM**

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5.2.7	Reactor size (inside casing dimensions) (D _R XW _R)	mm x mm	14766 x 14688
5.2.8	Configuration (sweeper placement per level: front wall / rear wall / side walls)	--	Front and rear wall. Refer SCR reactor arrangement
5.2.9	Flue Gas Dust Loading	g/Nm ³ (Max)	82
5.2.10	Low Dust or High Dust SCR	--	High Dust SCR
5.2.11	Fuel / Type of Coal	--	Refer TSR:007
5.2.12	Verification System Required	Yes / No	No
5.2.13	Pining material		*

\$ - Vendor to confirm

*- Vendor to fill

5.3 REQUIREMENTS FROM BHEL TO ASH SWEEPER SUPPLIER TO MEET PERFORMANCE GUARANTEES					
5.3.1	Requirement	Units	Value	Coverage (% Of Surface)	Deviation
5.3.2	Gas velocity distribution at catalyst inlet	%	±10	80	Deviation from Mean
5.3.3	Gas velocity distribution at catalyst inlet	%	±20	100	Deviation from Mean
5.3.4	No substantial accumulation of popcorn ash is deposited on catalyst surface				
NOTE	All ash sweepers are supplied and installed at the start of the project except Future layer ash sweepers.				

5.4	DESIGN CRITERIA	Units	Value
5.4.1	Required air pressure	Kg/cm ² (Gauge)	*
5.4.2	Required air flow rate when operating	Nm ³ /h	*
5.4.3	Required Air Quality Class as per ISO 8573-1	solids.water.oil	*
5.4.4	Interval between sweeper blasts	minutes	*
5.4.5	Area of coverage per sweeper	depth/width	*
5.4.6	Reaction thrust when a sweeper is fired	kg	*
5.4.7	Piping BOM details	-	*

5.5	CONSTRUCTION	Units	Value
5.5.1	ASME Pressure Vessel Size	L	*
5.5.2	ASME Pressure Vessel Material	material	*
5.5.3	Safety Cable Length	m	*
5.5.4	Safety Cable Material	material	*



Specification for ASH SWEEPER SYSTEM

TSR:006

Revision No.:01

5.5.5	Ash Sweeper Valve Type	-	*
5.5.6	Mounting components & blanking plates to allow future mounting in spare /future catalyst layer	Number	Required/Not required
5.6	Solenoid Valve Details	Units	Value
5.6.1	Solenoid Valve rating	V	24V DC
5.6.2	Solenoid valve Make & Model	-	*
5.6.3	End Connections	Inch	*
5.6.4	Body material	-	*
5.6.5	Single/Dual	single	*
5.6.6	Insulation class	Class H	*
5.6.7	Enclosure	IP65	*
5.7	Relief Valve Details	Units	Value
5.7.1	Relief valve Set pressure	Kg/cm ²	*
5.7.2	Make & Model	-	*
5.7.3	End connection details	-	*
5.7.4	Relief valve GA Drawing	-	*
5.7.5	Nozzle type	-	*

*- Vendor to fill

5.8	Hoses	Units	Value
5.8.1	Number of Hoses per Ash sweeper assembly	No	*
5.8.2	Hose End connections	-	*
5.8.3	Hose Make and Model	-	*
5.8.4	Hose GA drawing	-	*



Specification for
ASH SWEEPER SYSTEM

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6 ANNEXURE- A

BHEL APPROVED VENDOR LIST FOR SCR DE-DUSTING SYSTEM

Sl.no	Component/ equipment		Vendor
1	Sonic horns	a)	Integrated Global Services
		b)	Clyde Bergemann
		c)	Martin Engineering Company India Private
2	Ash Sweepers (Air Cannons)	a)	Integrated Global Services
		b)	Martin Engineering

NOTE 1 : Vendor list to be submitted for BHEL review along with credentials.

NOTE 2 : All applicable components, electrical equipment and accessories which are part of the dedusting system shall have PESO/CCOE certification and the same to be provided to BHEL.

NOTE 3: Any other alternate vendor shall be subjected to BHEL approval on submission of credentials to the fullest satisfaction of BHEL.

BHARAT HEAVY ELECTRICALS LIMITED

TIRUCHIRAPPALLI-620 014

Fuel Systems/PE(FB)



Technical Purchase Specification for
SONIC HORNS SYSTEM

Specification No.: **TSR:007**

Revision No.: 01

01	30.07.21	-	General Revision	VSN	GSK
Rev. No.	Rev. Date	Clause	Description	Chd.	Appd.

	Name	Signature	Date
Prepared	Preetam kumar	-Sd-	04-09-2019
Checked	V Shankar Naik	-Sd-	05-09-2019
Approved	G. Saravanakumar	-Sd-	06-09-2019



Specification for SONIC HORNS SYSTEM

TSR:007
Revision No.:01

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2 TECHNICAL SPECIFICATION

2.1 Scope

This specification defines the minimum requirements for the design, manufacture, testing, preparation for shipment and delivery of materials and engineering documentation, for this equipment. The supplier is solely responsible for correct design, engineering and supply of their scope of supply including support for erection and commissioning.

The offer shall be based on supplier recommendations, employ sonic horns at appropriate location, as mutually established so as to avoid major stiffeners and structure but so as to effectively clean the entire cross section area and volume of each catalyst level. In the event of conflicts between codes, standards, and this specification the more stringent requirements should apply and the conflict between these specifications shall be submitted to BHEL in writing. In the event of conflicts between specification, datasheets & contract specific requirements the following order is to be considered for the system design.

1. Contract specific requirement.
2. Datasheets.
3. Technical purchase specification.

2.2 Equipment, Materials and Services by Supplier

The Supplier's scope of supply includes, but is not necessarily limited to:

- Equipment and ancillaries are as defined in datasheet Sonic Horn Selection, P&ID, and General Arrangement Drawings located in [Section 5 of this document](#).
- 75 Hz Acoustic Horns - Straight Design.
- 75 Hz Acoustic Horns - Curved Design
- Air receiver tank
- De dusting system Erection drawings with BOM
- Mounting Rings or Tubes and Blank-off Plates (including fasteners) for future installation of additional acoustic horns, if applicable.
- All solenoid air valves, with associated bleed and block hand valves, pressure regulators, flexible hoses, air filters, Air receiver tank, and all other ancillary sub-equipment.
- System P&ID defining scope of supply, terminating points, piping, equipment, and instrumentation.
- Narrative explaining horn operational practice and suggested sequence.
- Manuals and instructions for storage, installation, commissioning, operating and maintenance.



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- Equipment data sheets are to be completed by the Supplier in order to inform BHEL about the equipment being supplied.
- Special tools required. For example, if a special tool is required during shop fabrication or handling, the device must be available on the construction site for installing that piece of equipment.
- Sonic horn system design shall include compressed air supply piping routing and DCS controls for all sonic horns including future layer sonic horns with the initial design itself to facilitate future tie-in for the spare catalyst layer. Receiver tank, fasteners, valves and other accessories required for the future layer shall be designed and supplied for this specification. Supplier to design and supply equipment in full where in only future layer sonic horns will be ordered to make the system complete. **Detailed BOM of piping shall be furnished by the supplier based on which piping shall be supplied by BHEL.**

2.3 Equipment, Materials and Services by Others

The scope of supply by others shall be:

- Unloading and storage at site
- Installation
- Testing, field performance monitoring, and inspections (Supplier to witness/assist)
- Utility systems piping up to terminal point
- Monorails and hoists
- Compressed air interconnecting piping to the Supplier's supplied equipment up to terminal point.
- Structural support steel
- Insulation
- Electrical wiring, conduits, trays, push buttons and starters external to Supplier supplied equipment
- DCS controls and remote alarms
- Instruments PG/PI, PIT/PT's and PDT/PDIT's are in BHEL scope as marked by terminal points and shown in P&ID for ash sweeper & sonic horn system in reference drawings.
- Ash sweepers in Future layer

2.4 Performance Guarantees

The equipment provided by the Supplier shall operate in accordance with the performance data in the datasheet(s) included herewith.

The equipment shall meet all applicable code requirements so that all required inspections are passed and permits obtained.



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BHEL and/or Owner may conduct field tests during start-up and after commercial operation of the installation for a period determined by the terms and conditions of purchase. With the boiler unit operating as mentioned in SCR/DD/PG/001 and the SCR in operation, the Supplier's sonic horn equipment shall be guaranteed to maintain the total pressure loss across each installed catalyst layer at a value no greater than as specified in SCR/DD/PG/001. The increase in pressure loss must be measured over a twenty-four (24) hour period of continuous operation of the SCR system. Supplier may expect that no significant accumulation of LPA (Large Particle Ash) is deposited on catalyst surfaces.

Total air consumption rate shall not exceed the instantaneous and averaged hourly rates as specified by the supplier on the data sheet in section 5 clause 5.4.04. Also the *total air consumption of ash sweepers and sonic horns put together shall be below the values mentioned in the De-dusting system/ performance guarantee SCR/DD/PG/001.*

The catalyst surface shall be free of accumulations of dust/ash that would harm or cause loss of catalyst performance.

The operating horn performance and operating sequence chosen by Supplier *shall not be less than 125dB at any point in the reactor.*

The Supplier shall fully cooperate with BHEL and Owner in defining a system test procedure. This test procedure shall consider individual horn performance, grouped or otherwise, both in the cold SCR and hot flue gas conditions. Monitoring of SCR system pressure drop criteria shall be determined in advance. Catalyst surface cleanliness criteria shall be determined based on SCR operating procedures and observations of dust accumulation accounting for operating time and fuels being fired. The Supplier's test procedure shall be mutually agreed upon by the concerned parties including, but not limited to, Supplier, BHEL and Owner.

The System must ensure operational cleanliness and performance of the SCR catalyst without any damage or deterioration of the catalyst and its ancillary equipment.

2.5 Detailed Requirements of Equipment

2.5.1 General

The SCR facility is designed and operated with flue gas having high dust concentrations. The flue gas conditions and fuel data for the resultant ash/dust, etc. are as defined in Section 5.



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The Supplier shall include mounting plates/rings or tubes (as required, one for each sonic horn), pre-drilled and tapped and/or weld-prepped, with all required fasteners and hardware. No welding to the horn sections is permitted.

The Supplier shall provide mounting components and blanking plates to allow future mounting of additional sonic horns on the spare layers of the SCR if specified in datasheets.

The horn driver diaphragm shall be proven and is to be made of Supplier's standard material for the service and be replaceable with the reactor in service.

The Supplier shall ensure that the Supplier's standard horn materials are suitable for the service. Generally, the outboard section(s) of the horn will be of Supplier selected cast iron and the inner section(s) of stainless steel. All sections shall be securely bolted to form an integral unit. If a longitudinal weld is required in the fabricated stainless steel section of the horn the weld shall have no re-entrant angles, and be of a regular profile both longitudinally and laterally with no undercut or concavity.

An insulated enclosure will be fabricated by BHEL to attenuate noise and to prevent corrosion due to a combination of condensation and ash plugging in the horn.

The Supplier must provide Material Safety Data Sheets (MSDS) for all coatings, paints, lubricants, preservatives, or chemicals that will be brought onto the site by the Supplier for whatever reason. The MSDS must be submitted before equipment is delivered on the site.

The Supplier shall provide a detailed description of any special lifting and/or installation requirements.

Vendor shall provide mounting details required for the Air receiver tank. The required fasteners shall be in the scope of supplier.

2.5.2 System Air Supply

In order for the Sonic Horn System to operate properly and safely under normal and expected conditions, the Supplier shall provide BHEL with complete data for the requirements of the Air Supply (see also datasheets Sonic Horn Selection in Section 5, to be completed by Supplier):

- Required air pressure (Kg/cm²(g)).
- Required air flow rate when operating (Nm³/hr).
- Acceptable moisture limit in order to avoid freezing.
- Acceptable range of oil and particulate content.
- Measures needed to avoid freezing, damage or failure of the System.



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The **air receiver tank** shall be included in the Supplier's scope of supply and it must have an **ASME stamp and be sized correctly** for all the acoustic horns on each reactor (one receiver per reactor). Each receiver shall include inlet and outlet nozzles, pressure relief valve, pressure gauge connection/stub as applicable, and manual drain valve.

2.5.3 Terminal Points

The Supplier shall furnish all equipment and services necessary to connect the equipment to the BHEL's system. Connections will include, but are not limited to the following as required by this specification:

- Refer attached P&ID for terminal points.
- Line mounted instruments shall be under the scope of supply of BHEL / Vendor as marked by terminal point.
- Supplier shall identify detail terminal points and applicable services in their proposal.

2.5.4 Instrumentation, equipment and valves

Supplier shall provide the valves as per BHEL valve schedule and specification. However, supplier shall provide the list and supply instruments, equipment and valves to make the system complete.

Also vendor to provide the complete P&ID equipment, valves, instruments in line with BHEL P&ID's in excel and drawing formats in the offer stage itself.

2.5.5 Pipe, Valves, and Fittings

The Supplier shall provide all equipment as per terminal point scope. The piping class shall be 300.

Flexible pipe connections to the sonic horns shall be stainless steel flex hose having threaded connections.

Piping material shall be stainless steel as per ASTM A312 Gr304. Detailed BOM of piping shall be furnished by the supplier based on which piping shall be supplied by BHEL.

2.6 Industry Reference Documents (Codes and Standards)

At a minimum, all work performed and materials provided by the Supplier must be in accordance with all applicable Centre, State and local laws, ordinances, and regulations.

The equipment will comply with the applicable portions of the following Codes and Standards. The applicable revision of each of these Codes and Standards will be the current edition with addenda or the edition adopted by the controlling jurisdiction at the time of the purchase order. In the event of a conflict between these documents and the specification, the Supplier shall



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submit a written request for an interpretation by BHEL. In general, the most stringent requirement shall govern.

- American National Standard Institute (ANSI)
- American Society of Testing and Materials (ASTM)
- American Society of Mechanical Engineers (ASME)
- American Petroleum Institute (API)
- Air Moving & Control Association (AMCA)
- American Gear Manufacturers Association (AGMA)
- Anti-Friction Bearing Manufacturers Association (AFBMA)
- Bureau of Indian Standards (IS)
- Environmental Protection Agency (EPA)
- Institute of Electrical and Electronic Engineers (IEEE)
- Insulated Power Cable Engineers Association (IPCEA)
- International Organization for Standardization (ISO)
- Steel Structures Painting Council (SSPC)
- Hydraulic Institute (HI)
- National Electrical Code (NEC)
- National Electrical Safety Codes (NESC)
- National Electrical Manufacturer's Association (NEMA)
- National Fire Protection Agency (NFPA)
- American Welding Society (AWS)
- American Institute of Steel Construction (AISC)
- Occupational Safety and Health Administration (OSHA)
- Joint Industrial Conference (JIC)
- Instrument Society of America (ISA)

2.7 Operating Sequences/Duration

An operating procedure shall be provided by the Supplier to define the operating parameters of the system including the function of each piece of equipment, sounding intervals/durations, control devices, and instrumentation. This operating procedure shall form a basis to instruct and train plant personnel.

Precise P&ID's, and complete equipment/system operating and maintenance instructions/manuals provided in accordance with this specification shall complement this narrative.

2.8 Surface Preparation and Painting

Project specific painting or Manufacturer's Standard whichever is applicable.



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2.9 Field Service

At the request of the BHEL, Supplier shall send a Field Engineer to provide technical assistance during construction/installation and commissioning free of cost.

BHEL will give Supplier sufficient notice prior to the site requirement for field service. Supplier stipulations that require a field service engineer or technician, such as inspection prior to equipment start up, shall be indicated in writing.

2.10 Spare Parts

The Supplier shall provide a list of recommended spare parts including start-up and commissioning spares and special tools, with and without pricing, and a schedule of part replacements based on the operation and service conditions specified.

2.11 Operation and Maintenance Manual

The operation and maintenance instructions must be supplied with manuals or cut sheets for all purchased components, plus sufficient specific equipment information to accomplish the following:

Proper identification of the equipment, including nameplate data where applicable.

Proper handling and storage on-site prior to installation and commissioning.

Proper installation.

Performance and necessary pre-operation conditioning or checkout and test.

Safe and successful initial and subsequent operation.

Proper maintenance, by describing schedule and activity.

Proper lubrication, by providing lubrication schedule, lubricant specifications, and alternates.

Proper calibration, both initial and after prolonged usage.

Proper ordering of parts, components, and sub-assemblies, by supplying appropriate identification and ordering information.

Proper spare parts inventory.

Equipment checks and tests, by supplying performance curves, charts, etc., as applicable.

2.12 Documents to be submitted along with the offer

- a) Filled in data sheets
- b) Point wise compliance to the specification
- c) Deviations to the specification (if any) shall be clearly spelt out in detail.



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- d) Overall dimensional assembly drawing for the selected variant along catalogues, drawings and O&M manuals.
- e) Cross sectional drawing with parts and materials identified with sonic horn assembly details.
- f) Full designation with description of the designation codes for the selected variant.
- g) Relief valve dimensional drawing, data sheet and selection criteria.

2.13 Documents to be submitted after placement of order

Following documents shall be submitted along with the supplies.

- a) Functional write up
- b) Equipment training manual
- c) O&M instruction in soft version
- d) Dimensional drawing
- e) Cross section drawing with material identification and sonic horn assembly details and Data sheets.
- f) Erection drawings along with BOM clearing all the interferences in boiler and SCR for BHEL review. BHEL will provide necessary General arrangement and floor plan drawings for preparation of erection drawings.

2.14 Packing

- a) All opening shall be firmly capped against ingress of water or dust.
- b) Shall be seaworthy packed in wooden boxes with water proof under cover for export jobs and road worthy packing for inland jobs.
- c) Liberal packing material & struts shall be used to arrest rolling & to protect from transit damages.

2.15 Marking

Stainless steel name plates with following boldly engraved shall be firmly fixed to the body with Maker's name & production serial number, tag number and sonic horn designation.

2.16 Guarantee

Vendor shall guarantee for manufacturing defects for a period of 12 months from the date of commissioning or 18 months from the date of supply whichever is earlier.

Vendor shall guarantee the performance of the de dusting system as per performance guarantee SCR/DD/PG/001.



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3 Attachments and Reference Documents

3.1 Datasheets

Document No.	Description
Sub section of Section 5.0	Sonic horn selection and Data sheets
1	General information
2	Performance data
3	Requirements from BHEL to sonic horn supplier to meet performance guarantees
4	Design criteria
5	Construction
6	Filter
7	Receiver tank
8	Sonic horn performance guarantee (required of the seller)



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4 Customer Specifications, Attachments, and Reference Documents

4.1 Customer Specifications & data sheets

Nil

4.2 Reference Drawings

Nil



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5 Sonic Horn Selection and Data Sheets

		SONIC HORN SELECTION	
		Owner / Client: UPRVUNL	Customer Number: 1728
Confidential	Data Revision Date	Plant: PANKI TPP	Data Sheets
		Unit No: 1	
See NOTICE below	...	Location: PANKI, KANPUR, UTTAR PRADESH	

NOTICE: This document and the information, design, and material contained and/or illustrated herein (hereinafter "proprietary material"), is the property of COMPANY and is submitted, lent, and furnished to recipient in strict confidence with the express understanding that the recipient shall not reproduce, copy, loan, dispose of, or disclose to anyone outside recipient's organization, directly or indirectly, or use said proprietary material for any purpose other than that for which it is furnished and submitted by COMPANY. Recipient by receiving said proprietary material agrees to these terms, not to use the proprietary material in any way injurious to the interests of COMPANY, and to return the same upon request by COMPANY.

5.1	GENERAL INFORMATION	
5.1.1	Equipment Name	Sonic Horn
5.1.2	Quantity (For the boiler)	60 [§] Present + 20 [§] Future #
5.1.3	Tag Number(s)	SH01 to SH60
5.1.4	Indoor/Outdoor:	Outdoor
	Reference documents	Drawing / document number
5.1.5	P&ID for ash sweeper system	3-SR-500-00075
5.1.6	P&ID SCR Reactor	0-SC-288-90001
5.1.7	SCR Reactor arrangement	1-SR-000-00004
5.1.8	P&ID for sonic horn system (TP details)	3-SR-500-00076
5.1.9	Valve list	SR/1728/VALVE/001

§ - Vendor to confirm

- Provision for future is required including valves, pipes and necessary accessories making the system complete except sonic horns.



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5.2 PERFORMANCE DATA

		Units	Value / unit
5.2.1	Number of Units	No	1
5.2.2	Number of reactors per unit	No	2
5.2.3	Reactor designations per unit	A / B / C / D, etc.	A,B
5.2.4	Number of levels of horns per reactor	No	4 (3 Present + 1 Future) #
5.2.5	Number of horns per level per reactor	No	10 [§]
5.2.6	Total number of horns per reactor	No	30 [§] Present + 10 [§] Future #
5.2.7	Total of horns (per boiler)	No	60 [§] Present + 20 [§] Future #
5.2.8	Reactor size (inside casing dimensions)	mm x mm	14766 x 14688
5.2.9	Configuration (horn placement per level: front wall, rear wall, north, south, other)	--	Left Side Wall, Right Side Wall
5.2.10	Arrangement type (bell section "C" inside reactor, flush mounted, or other)	--	*
5.2.11	Advocated horn type (straight, curved, or other)	--	Straight
5.2.12	Thermal Wrap	Yes / No	No
5.2.13	Verification System	Yes / No	No
5.2.14	Flue Gas Dust Loading	g/Nm ³	82
5.2.15	Low Dust or High Dust SCR	--	High Dust SCR
5.2.16	Fuel / Type of Coal		As furnished below
5.2.17	Mounting components & blanking plates to allow future mounting in spare catalyst layer	Number	Required/ Not required

§ - Vendor to confirm

* - Vendor to fill

- Provision for future is required including valves, pipes and necessary accessories making the system complete except sonic horns.



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5.2.16 COAL PROPERTIES



352 - 200 C
Dt. 31.08.17

FUEL ANALYSIS - COAL

DESCRIPTION (Source / Type)	UNIT	Performance / Design Coal	Worst Coal	Best Coal
PROXIMATE ANALYSIS				
Fixed carbon	%	28.50	26.00	29.00
Volatile matter	%	26.00	19.00	27.00
Moisture	%	10.50	12.00	12.00
Ash	%	35.00	43.00	32.00
Total	%	100.0	100.0	100.0
HHV	kcal / kg	3700	3200	4200
LHV	kcal / kg			
Ash	kg / 10 ⁶ kcal	94.59	134.38	76.19
ULTIMATE ANALYSIS				
Carbon	%	42.00	33.50	44.00
Hydrogen	%	2.00	2.40	2.77
Sulphur	%	0.46	0.45	0.50
Nitrogen	%	1.60	1.30	1.50
Oxygen (difference)	%	8.44	7.35	7.23
Moisture	%	10.50	12.00	12.00
Ash	%	35.00	43.00	32.00
HARD GROVE INDEX				
		53	50	55
ASH CHARACTERISTICS (Reducing Atmosphere)				
IT - Initial deformation temp.	°C	1200	1154	1165
ST - Softening temp. H = W	°C	-	-	-
HT - Hemispherical temp. H = W / 2	°C	1350	1300	>1350
FT - Fusion temp.	°C	>1400	>1400	>1400
ASH CONSTITUENTS				
A - Si O ₂	%	57.6	54.9	62.3
A - Al ₂ O ₃	%	27	28.6	25.1
B - Fe ₂ O ₃	%	8.8	10.1	5.5
B - CaO	%	1.7	1.96	1.58
B - MgO	%	1.16	1.33	1
B - Na ₂ O	%	0.2	0.08	0.5
B - K ₂ O	%	1.36	0.87	1.96
A - TiO ₂	%	1.66	1.86	1.26
P ₂ O ₅	%	0.34	0.2	0.5
SO ₃	%	0.18	0.1	0.3
Base / Acid Ratio		0.153	0.168	0.119
Fe ₂ O ₃ / CaO Ratio		3.1	3.1	2.1
HCL	ppm(Wet)		45	
HF	ppm(Wet)		12	

Note: As per tender specification Appendix II, Chapter 2, Sheet 3 of 7, Ash constituents based on mail received from PS-PMG on 27.07.18.

Sheet 1 of 2

Customer / Plant: UPRVUNL / PANKI TPS Extn. 1 x 660 MW

Prep / Cont. No. : 1728	Rev. 0		Rev. 1		Rev. 2		Rev. 3	
	Sign	Date	Sign	Date	Sign	Date	Sign	Date
Engineer : VRK / VKT	-Sd-	28.04.18	<i>VRK</i>	06.03.19				
Reviewer : BMM	-Sd-	28.04.18	<i>BMM</i>	06.03.19				
Approver : BMM/ACR	-Sd-	28.04.18	<i>ACR</i>	06.03.19				



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5.2.14 Flue gas conditions

As furnished below

Sl. No.	Description	Unit	TMCR DC	BMCR WC	60% TMCR DC
				Guarantee Point	
1.	Flue Gas flow	t/h	2366	2718	1479
2.	Volumetric Gas Flow (wet-dust free)	Nm ³ /s	514	596	319
3.	Flue Gas temperature	°C	337	349	322
4.	Pressure at SCR duct inlet	mmWc	-150	-199	-56
5.	Flue gas constituents, Wet Basis - % by weight				
	i. CO ₂	% by wt	22.182	20.824	22.182
	ii. N ₂	% by wt	68.904	68.666	68.904
	iii. SO ₂	% by wt	0.133	0.153	0.133
	iv. Moisture	% by wt	5.324	6.911	5.324
	v. O ₂	% by wt	3.458	3.446	3.458
	vi. HCl (wet basis)	ppmv	-	-	-
	vii. HF (wet basis)	ppmv	-	-	-
6.	O ₂ (dry vol. basis)	%	3.531	3.564	3.531
7.	Inlet Particle dust conc. (wet)	gm/Nm ³	57	79.1	57.4



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REQUIREMENTS FROM BHEL TO SONIC HORN SUPPLIER TO MEET PERFORMANCE

5.3 GUARANTEES

5.3.1	Requirement	Units	Value	Coverage (% Of Surface)	Deviation
5.3.2	Gas velocity distribution at catalyst inlet	%	±10	80	Deviation from Mean
5.3.3	Gas velocity distribution at catalyst inlet	%	±20	100	Deviation from Mean
5.3.4	No substantial accumulation of popcorn ash is deposited on catalyst surface				

NOTES:

- 1) Insulation by BHEL.
- 2) All sonic horns are supplied and installed at the start of the project.

5.4	DESIGN CRITERIA	Units	Value
5.4.1	Frequency	Hz	*
5.4.2	Noise level	dB	*
5.4.3	Required air pressure	Kg/cm ² (Gauge)	*
5.4.4	Required air flow rate when operating	Nm ³ /hr	*
5.4.5	Recommended Receiver Size (one per reactor)	Litre	*
5.4.6	Allowable oil particle size	Microns	*
5.4.7	Maximum oil content within ambient operating temperature range	PPM	*
5.4.8	Allowable solid particle size	microns	*
5.4.9	Allowable solid particle content	PPM	*
5.4.10	Allowable dew point	°C	*
5.4.11	Interval between horn soundings	minutes	*
5.4.12	Duration of horn sounding	seconds	*
5.4.13	Area of coverage per horn	depth/width	*
5.4.14	Total catalyst surface area to be cleaned by the horns	m ²	*
5.4.15	Life of titanium diaphragm	hours	*
5.4.16	Piping BOM details		*

5.5	CONSTRUCTION	Units	Value
5.5.1	Sound generator diaphragm construction		*



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5.5.2	Diaphragm material		Titanium alloy [§]
5.5.3	Diaphragm thickness		*
5.5.4	Diaphragm thickness tolerance		*
5.5.5	Diaphragm diameter		*
5.5.6	Diaphragm diameter tolerance		*
5.5.7	Bell section "A" material (ASTM number & grade)	ASTM number & Grade	*
5.5.8	Bell section "B" material (ASTM number & grade)	ASTM number & Grade	*
5.5.9	Bell section "C" material (ASTM number & grade)	ASTM number & Grade	*
5.5.10	Mounting assembly material (ASTM number & grade)	ASTM number & Grade	*
5.5.11	Minimum size casing opening for the mounting arrangement		*
5.5.12	Flange gasket material		*
5.5.13	Gasket for driver required	(Y / N)	*

5.6	Filter	Units	Value
5.6.1	Quantity	No	2
5.6.2	Filter Type	-	*
5.6.3	Allowable DP across filter	Kg/Cm2	*
5.6.4	Make	-	*
5.6.5	Model	-	*
5.6.6	Size	-	*
5.6.7	End Connection Details	-	*

5.7	Receiver Tank	Units	Value
5.7.1	Size	-	*
5.7.2	Hyd Test pr.	-	*
5.7.3	GA drawing number with Foundation details	-	*
5.7.4	Make of Relief valve	-	*
5.7.5	Model of relief Valve	-	*

* - Vendor shall fill.
§ - Vendor to confirm



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6 ANNEXURE-A

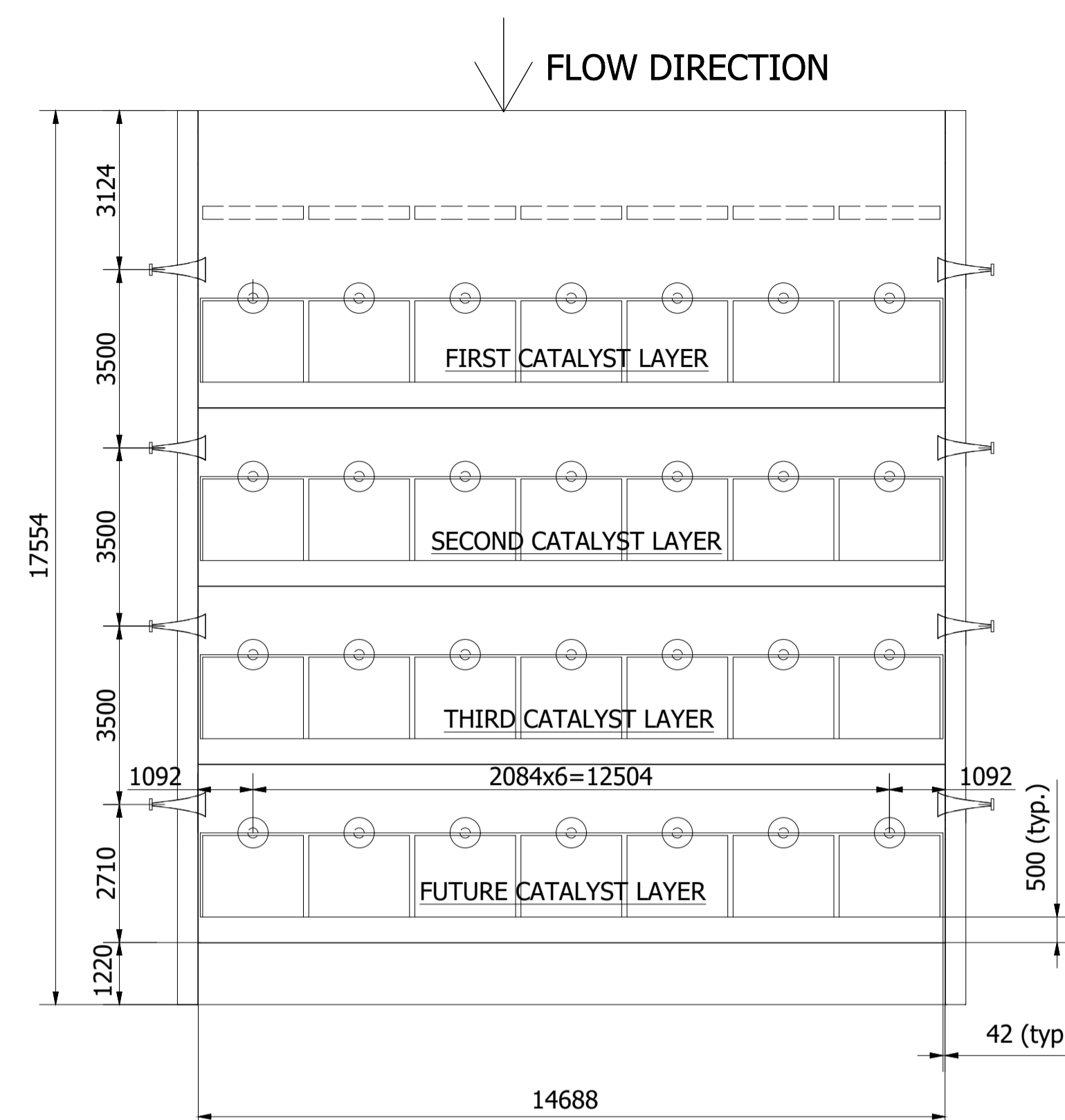
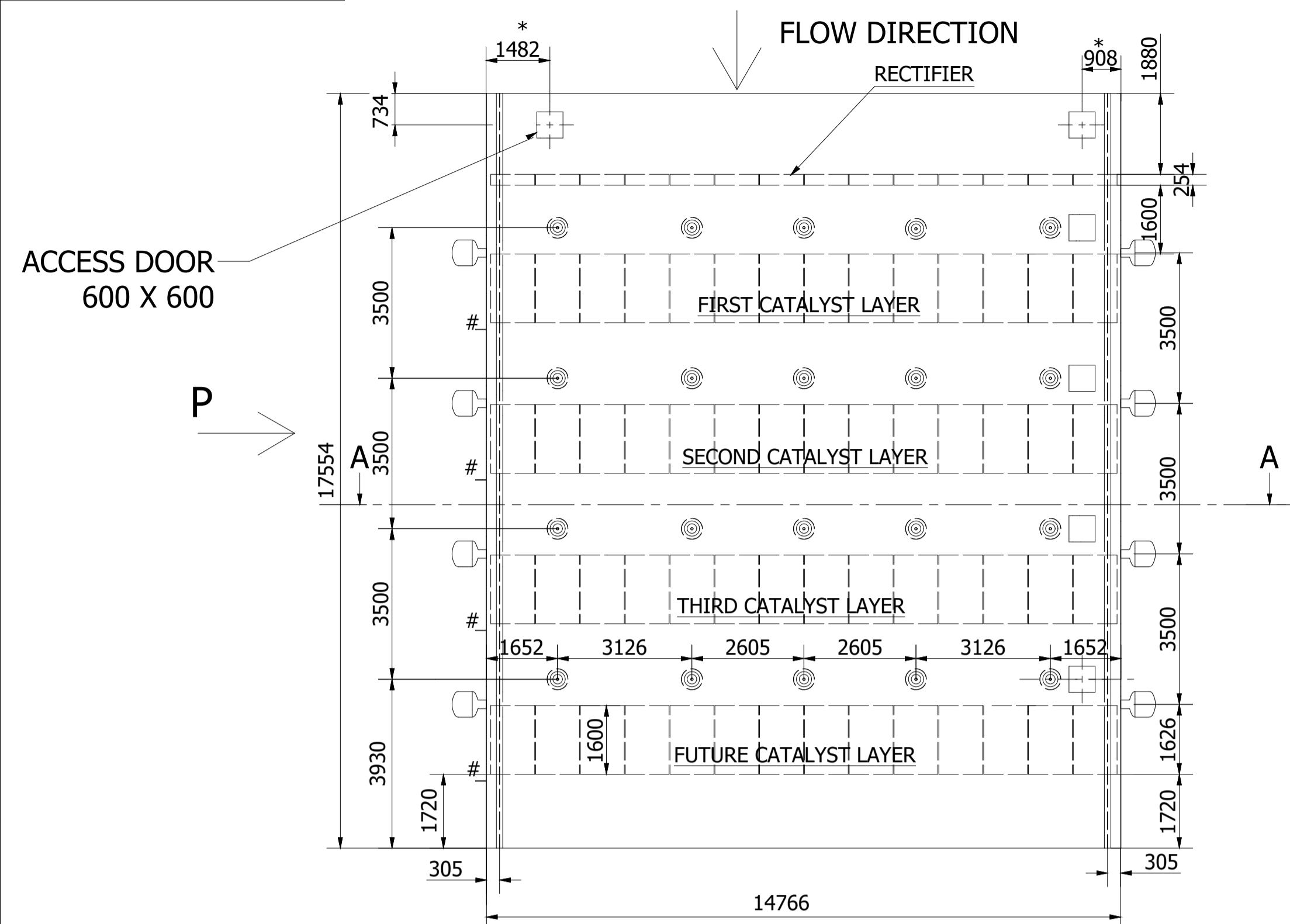
BHEL APPROVED VENDOR LIST FOR SCR DE-DUSTING SYSTEM

Sl.no	Component/ equipment		Vendor
1	Sonic horns	a)	Integrated Global Services
		b)	Clyde Bergemann
		c)	Martin Engineering Company India Private
2	Ash Sweepers (Air Cannons)	a)	Integrated Global Services
		b)	Martin Engineering

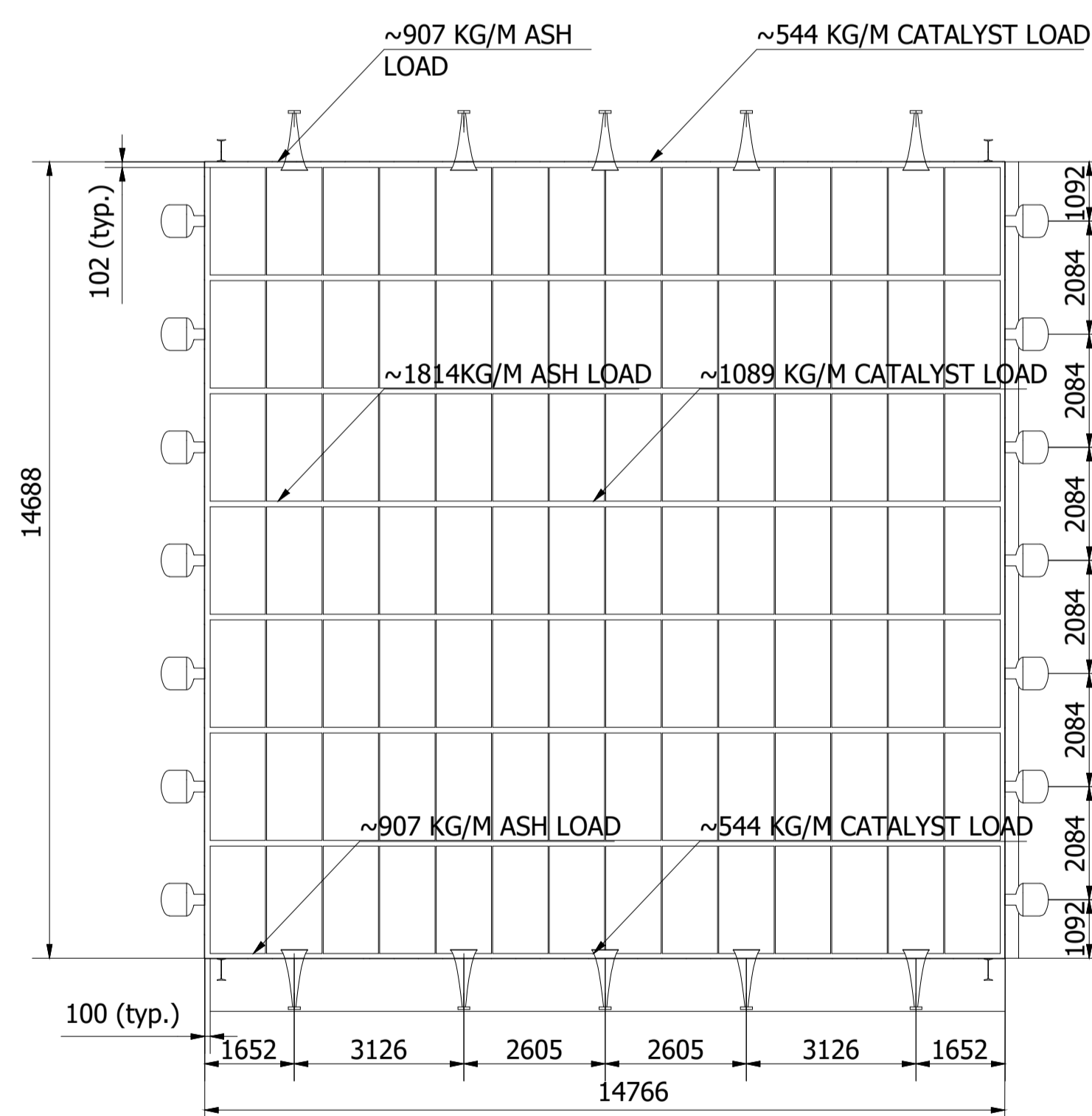
NOTE 1 : Vendor list to be submitted for BHEL review along with credentials.

NOTE 2 : All applicable components, electrical equipment and accessories which are part of the dedusting system shall have PESO/CCOE certification and the same to be provided to BHEL.

NOTE 3: Any other alternate vendor shall be subjected to BHEL approval on submission of credentials to the fullest satisfaction of BHEL.



VIEW - P

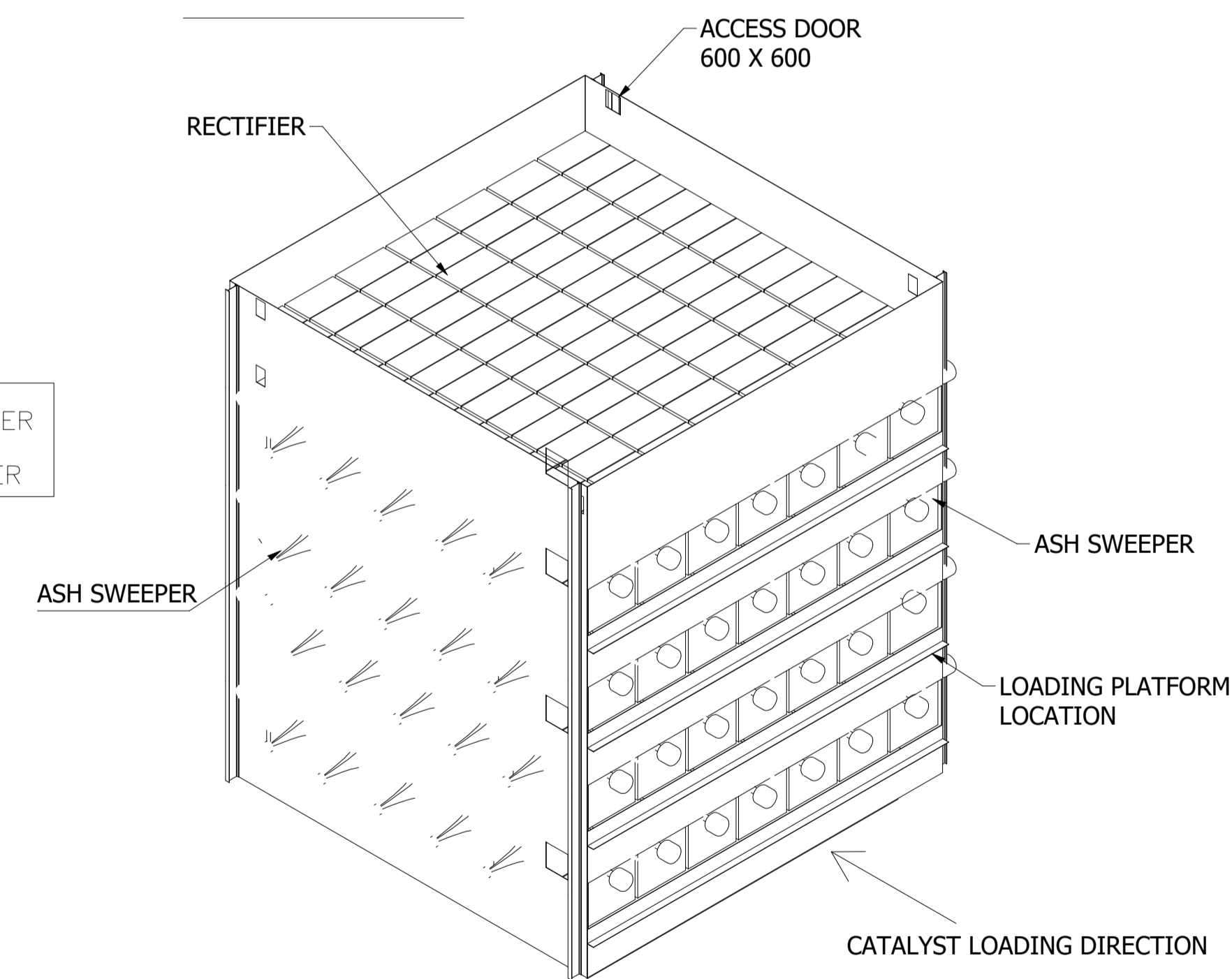


SECTION-A-A (1 : 100)

NOTES:

1. NUMBER OF REACTORS PER BOILER: 2
2. NUMBER OF CATALYST MODULES PER LAYER: 98 (7W X 14D)
3. # CATALYST MODULE LOADING PLATFORM
4. * ACCESS DOOR LOCATION SHOULD CLEAR STRAP IN REACTOR

- ⊙ ASH SWEEPER, 56 NOS(42 PRESENT+14 FUTURE) PER REACTOR, 112 NOS PER BOILER
- ⊙ SONIC HORN, 40 NOS (30 PRESENT+10 FUTURE) PER REACTOR, 80 NOS PER BOILER



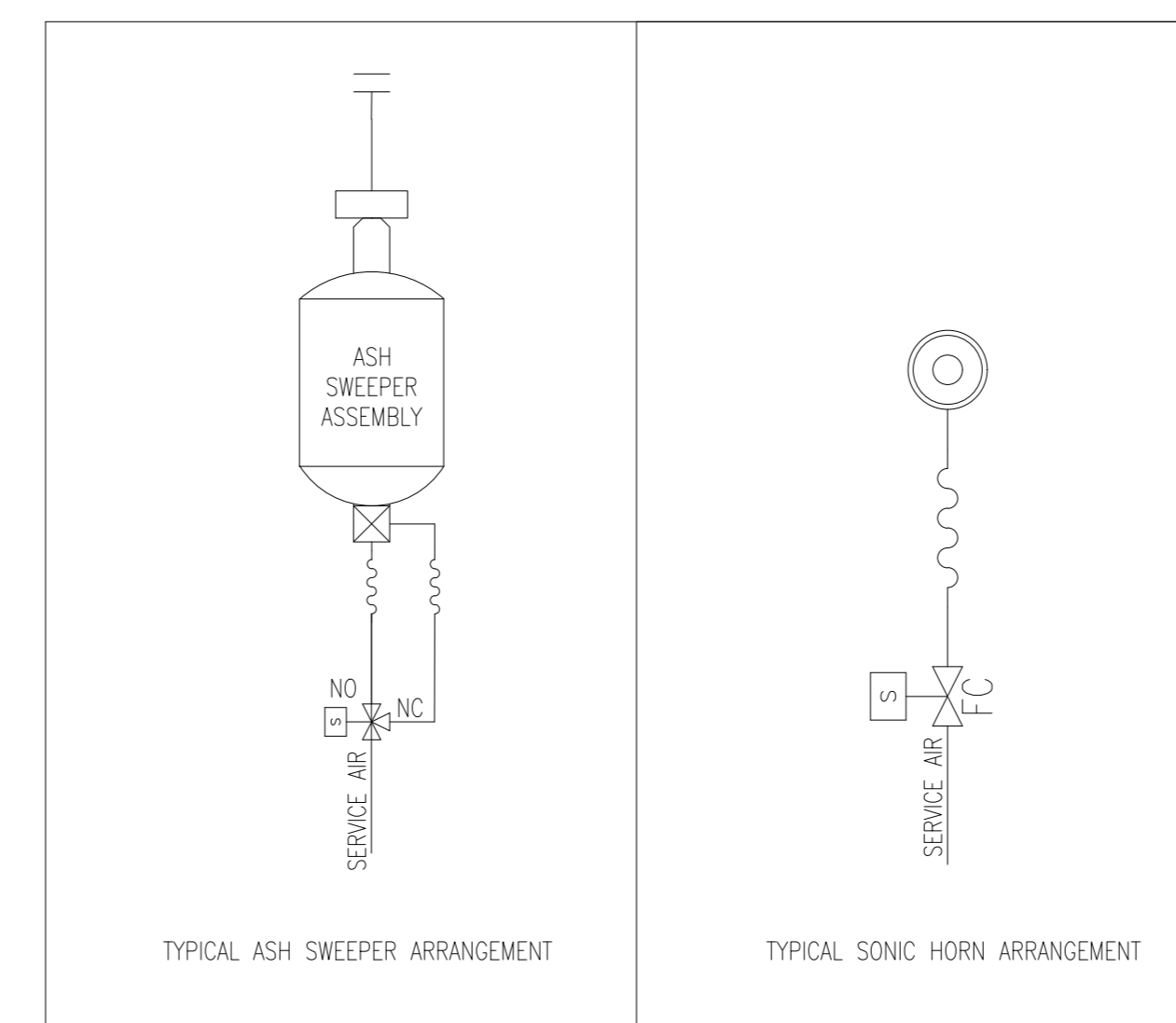
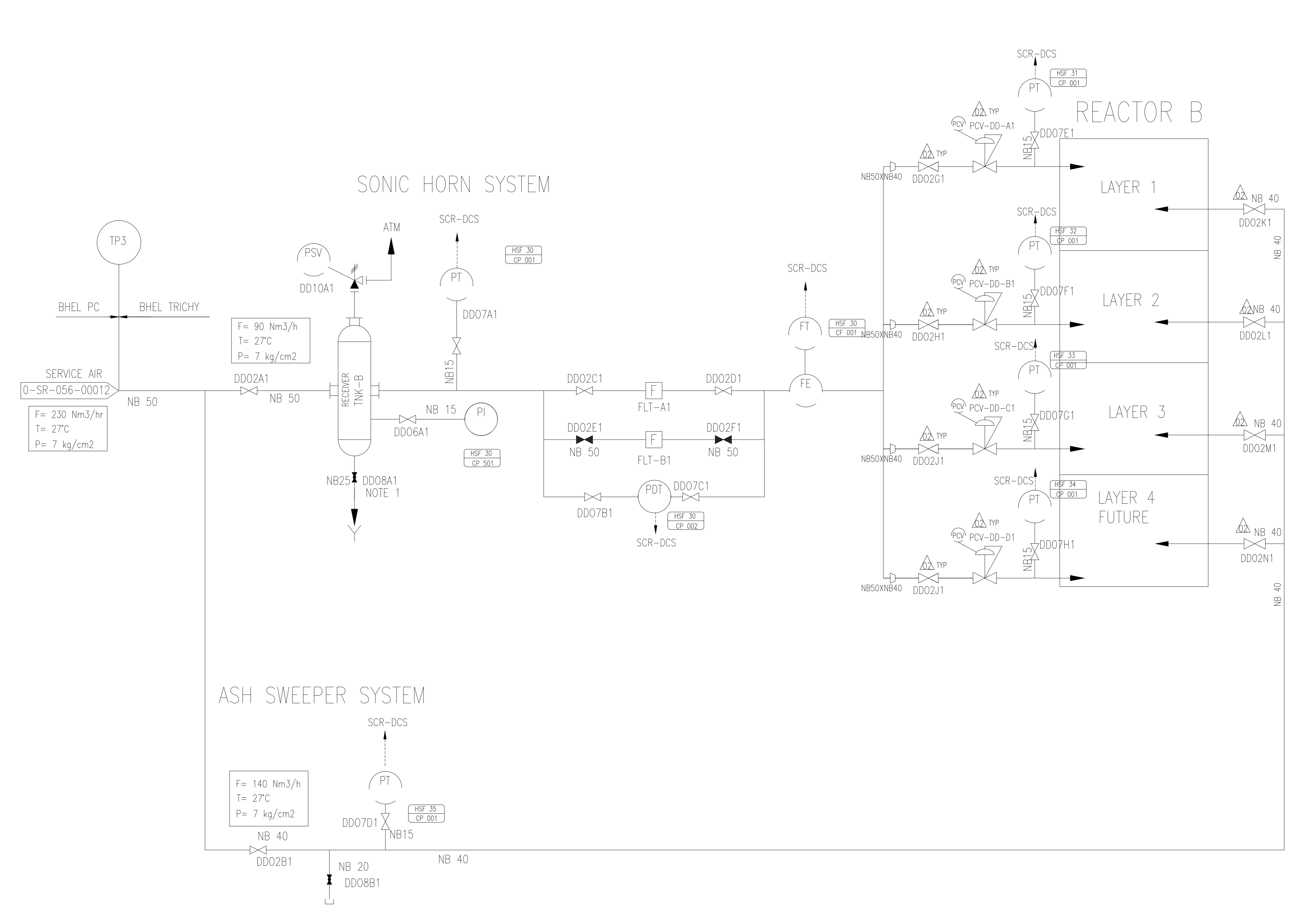
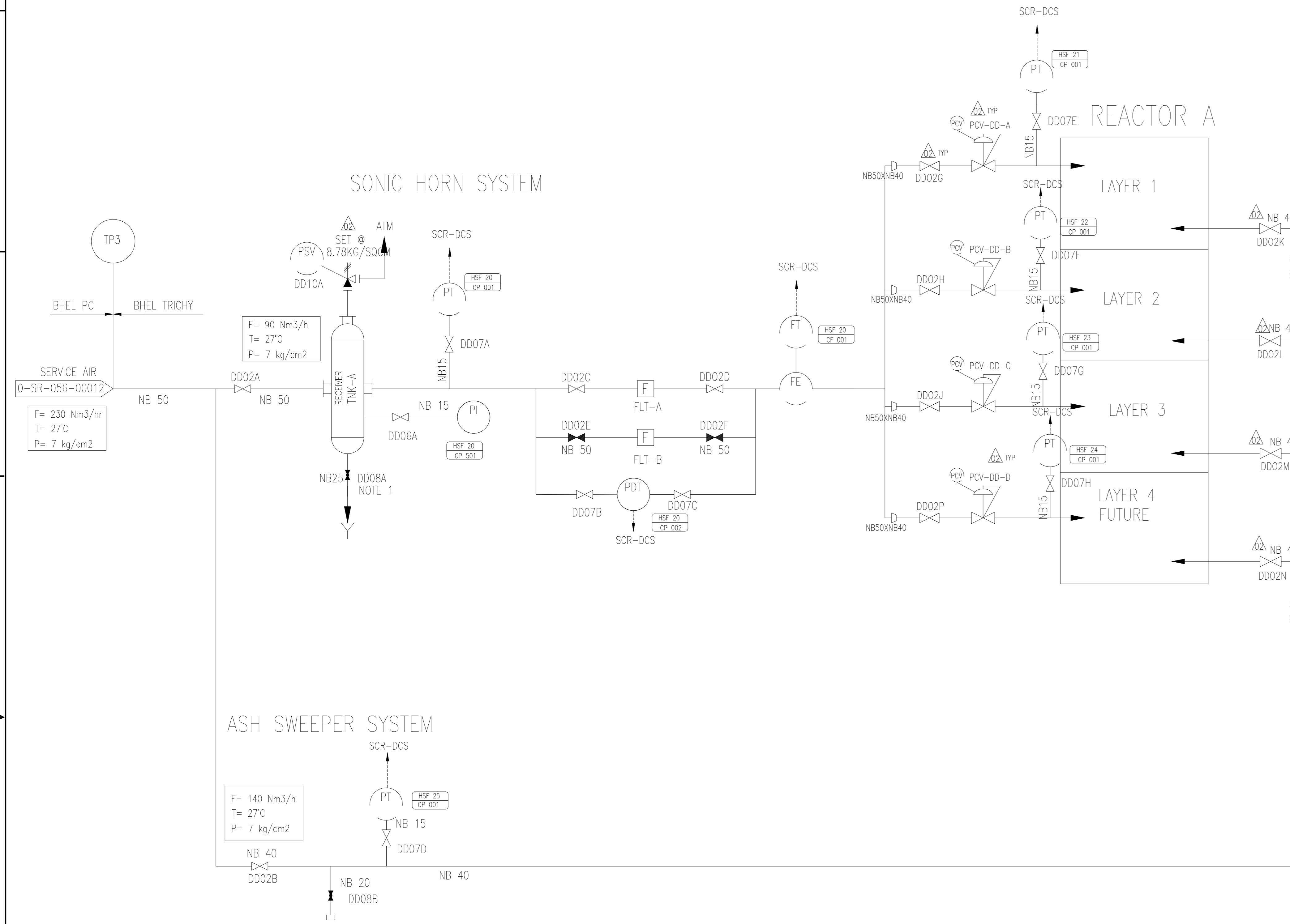
ISO VIEW

CUST. NO.-1728

<p>CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any form without the consent of the company.</p>	TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		PANKI THERMAL POWER STATION Extn-1X660MW	
			DRN	DHEERAJ KUMAR
	UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014		CHD	SRINIVASU ARUGULA
	DEPT: FS CODE: 129		APPR	SARAVAN KUMAR C
TITLE: SCR REACTOR ARRANGEMENT		DRAWING NO: 1-SR-000-00004		REV: A

DE-DUSTING SYSTEM FOR REACTOR A

DE-DUSTING SYSTEM FOR REACTOR B



- NOTES:
1. AUTO DRAIN INTEGRAL TO RECEIVER TANK

REV	DATE	ALTERED BY	REASON	REV	DATE	ALTERED BY	REASON
02	20.04.2022	SARAM	CHD & APPD : GANGADHAR	01	20.04.2022	SARAM	CHD & APPD : GANGADHAR
ZONE	PAID UPDATED FOR SYSTEM REQUIREMENTS. NECESSARY VALVES ADDED IN SONIC HORN & ASH SWEEPER LINES AS INDICATED.			ZONE	PAID UPDATED AS PER CUSTOMER COMMENTS		

CUSTOMER NO.: 1728

DRG. No. 9962-TR-101-PVM-L-009 REV.02

PROJECT: 1 X 660MW PANKI THERMAL POWER EXTENSION PROJECT.

OFFICE: UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LTD.

CLIENT: NTPC LTD. (A GOVERNMENT OF INDIA ENTERPRISE)

CONSULTANT: DEVELOPMENT CONSULTANTS PVT. LTD. KOLKATA

BOILER PLANT UNIT: BHARAT HEAVY ELECTRICALS LTD. TIRUCHIRAPALLI-620014, INDIA.

DRG TITLE: P&ID FOR CATALYST DE DUSTING SYSTEM

QSCRM

ALL DIMENSIONS IN MILLIMETERS

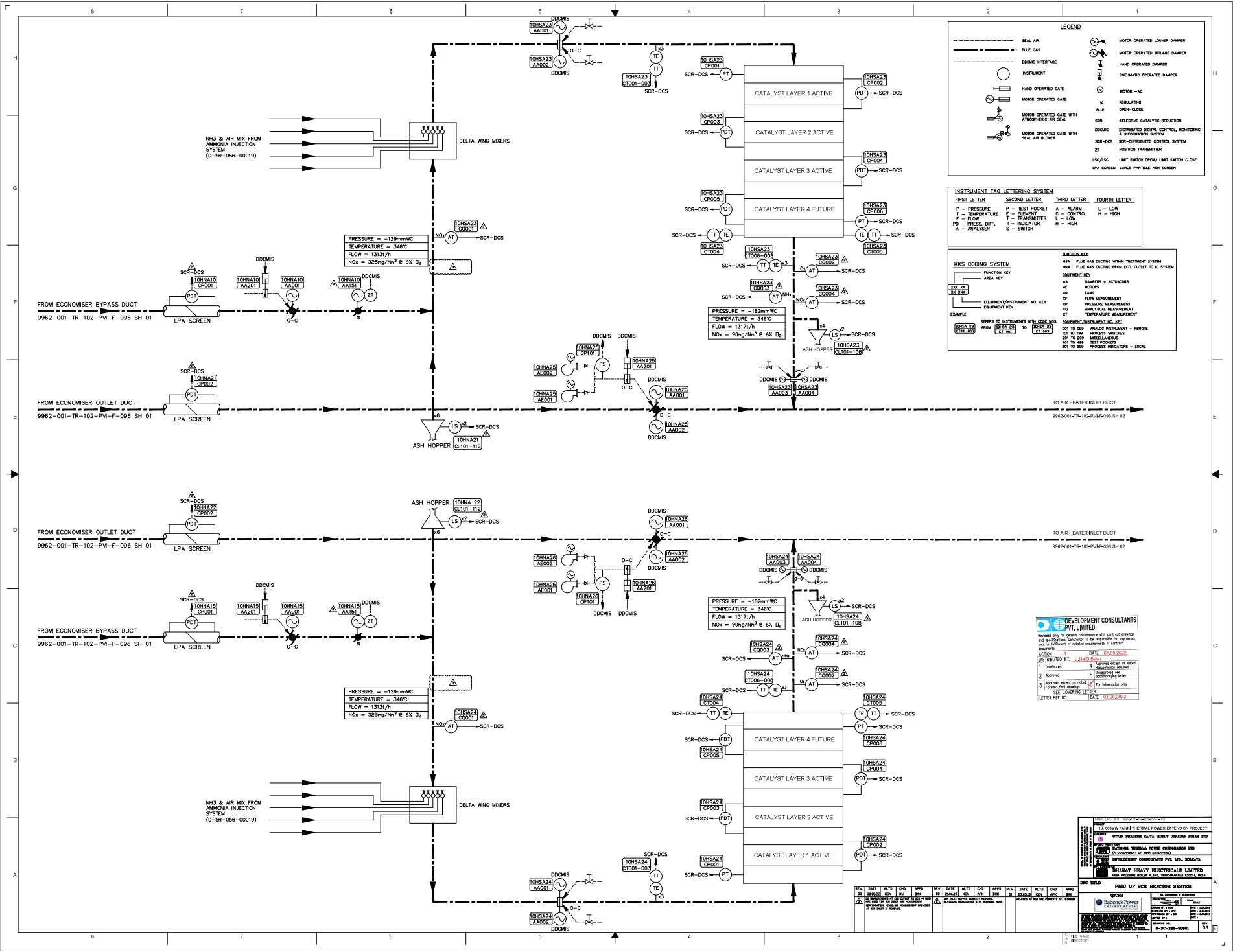
PROJECTION: SCALE:

DRAWN BY : CHEERAJ DATE : 16.02.2019
CHECKED BY : FAZL DATE : 16.02.2019
APPROVED BY : GANGADHAR DATE : 16.02.2019
VETTED BY : SBE DATE : 16.02.2019

DRAWING NO. 0-SR-056-00022 REV. 02

Babcock Power Environmental

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LEGEND

- SEAL AIR
- - - FLEW GAS
- DDCMS INTERFACE
- INSTRUMENT
- HAND OPERATED GATE
- MOTOR OPERATED GATE WITH ATMOSPHERIC AIR SEAL
- MOTOR OPERATED GATE WITH SEAL AIR BLOWER
- MOTOR OPERATED LOWER DAMPER
- MOTOR OPERATED REPLANE DAMPER
- HAND OPERATED DAMPER
- PNEUMATIC DAMPER
- MOTOR - AC
- SEALING
- OPEN-CLOSE
- O-C
- SCR
- DDCMS
- SCR-DCS
- SCR-DISTRIBUTED CONTROL SYSTEM
- ZT
- LPA/ASC
- LMT SWITCH OPN/LMT SWITCH CLOSE
- LPA SCREEN
- LARGE PARTICLE ASH SCREEN

INSTRUMENT TAG LETTERING SYSTEM

FIRST LETTER	SECOND LETTER	THIRD LETTER	FOURTH LETTER
P - PRESSURE	F - TEST POINT	A - ALARM	L - LOW
T - TEMPERATURE	E - ELEMENT	C - CONTROL	H - HIGH
F - FLOW	S - TRANSMITTER	L - LOW	H - HIGH
PD - PRESS. DIFF.	I - INDICATOR	H - HIGH	L - LOW
A - ANALYSER	S - SWITCH		

FUNCTION KEY

- HEA FLEW GAS DUCTING WITHIN TREATMENT SYSTEM
- HEA FLEW GAS DUCTING FROM ECO. DUCT TO 22 SYSTEM

EQUIPMENT KEY

- AA DAMPERS + ACTUATORS
- AE MOTORS
- AN FANS
- OF FLOW MEASUREMENT
- OP PRESSURE MEASUREMENT
- OS ANALYTICAL MEASUREMENT
- OT TEMPERATURE MEASUREMENT

KKS CODING SYSTEM

- FUNCTION KEY
- AREA KEY

EXAMPLE

RETURNS TO INSTRUMENTS WITH CLOSE SIZE

FROM (9962-01-TR-102-PV-F-096 SH 01)	TO (9962-01-TR-102-PV-F-096 SH 02)
(ET-02)	(ET-02)

DEVELOPMENT CONSULTANTS PVT. LIMITED.

Revised only for special conference with control drawing and specifications. Contract to be reviewed for any errors and for addition of needed requirements if contract is amended.

DESIGNED BY: D.D. GUNDE

APPROVED BY:

1. Checked
2. Approved
3. Issued for work
4. New edition required
5. Resubmitting letter

Approved current in version 1.0 for installation only.

Checked for drawings: SEE COVER SHEET

LETTER REF NO. DATE: 01.08.2022

PROJECT INFORMATION

1.15 HEMBAI PAPER THERMAL POWER ELECTRICITY PROJECT

OTHER PROJECTS: BAYU LINDU UTAMA BEMBAI LTD.

DESIGNED BY: NATIONAL THERMAL POWER CORPORATION LTD. (A COMPANY OF BHE GROUP)

ENGINEER: NATIONAL THERMAL POWER CORPORATION PVT. LTD., BEMBAI

DRAWN BY: HEMBAI HEAVY ELECTRONICS LIMITED

FOR: NATIONAL THERMAL POWER CORPORATION PVT. LTD., BEMBAI

DWG TITLE: PAID OF SCR REACTOR SYSTEM

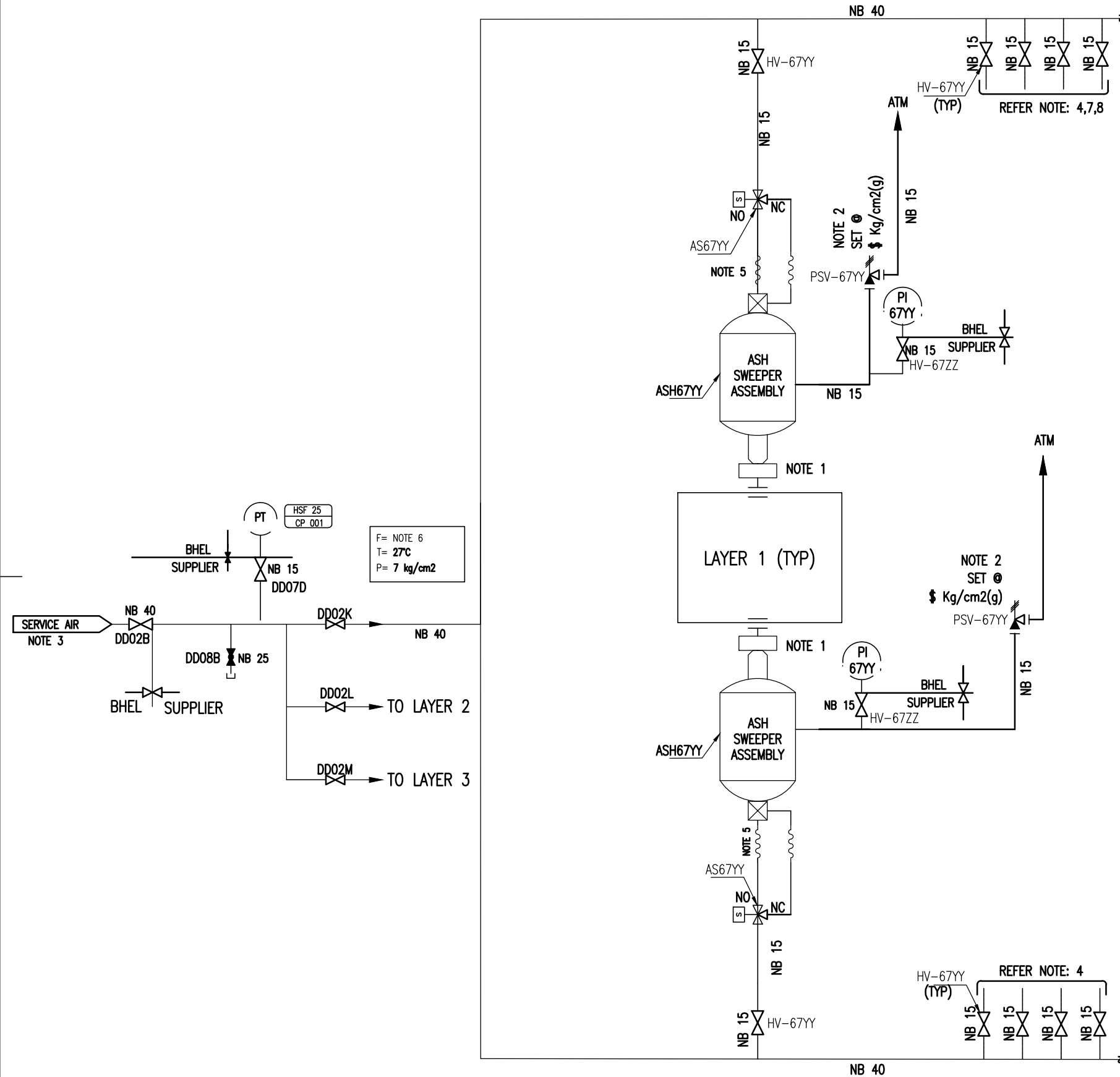
DATE: 01.08.2022

SCALE: AS SHOWN

PROJECT NO: 0-10-88-0001

03

REV.	DATE	ALT.	BY	APP.	REV.	DATE	ALT.	BY	APP.	REV.	DATE	ALT.	BY	APP.
1	01.08.2022		D.D. GUNDE		1	01.08.2022		D.D. GUNDE		1	01.08.2022		D.D. GUNDE	

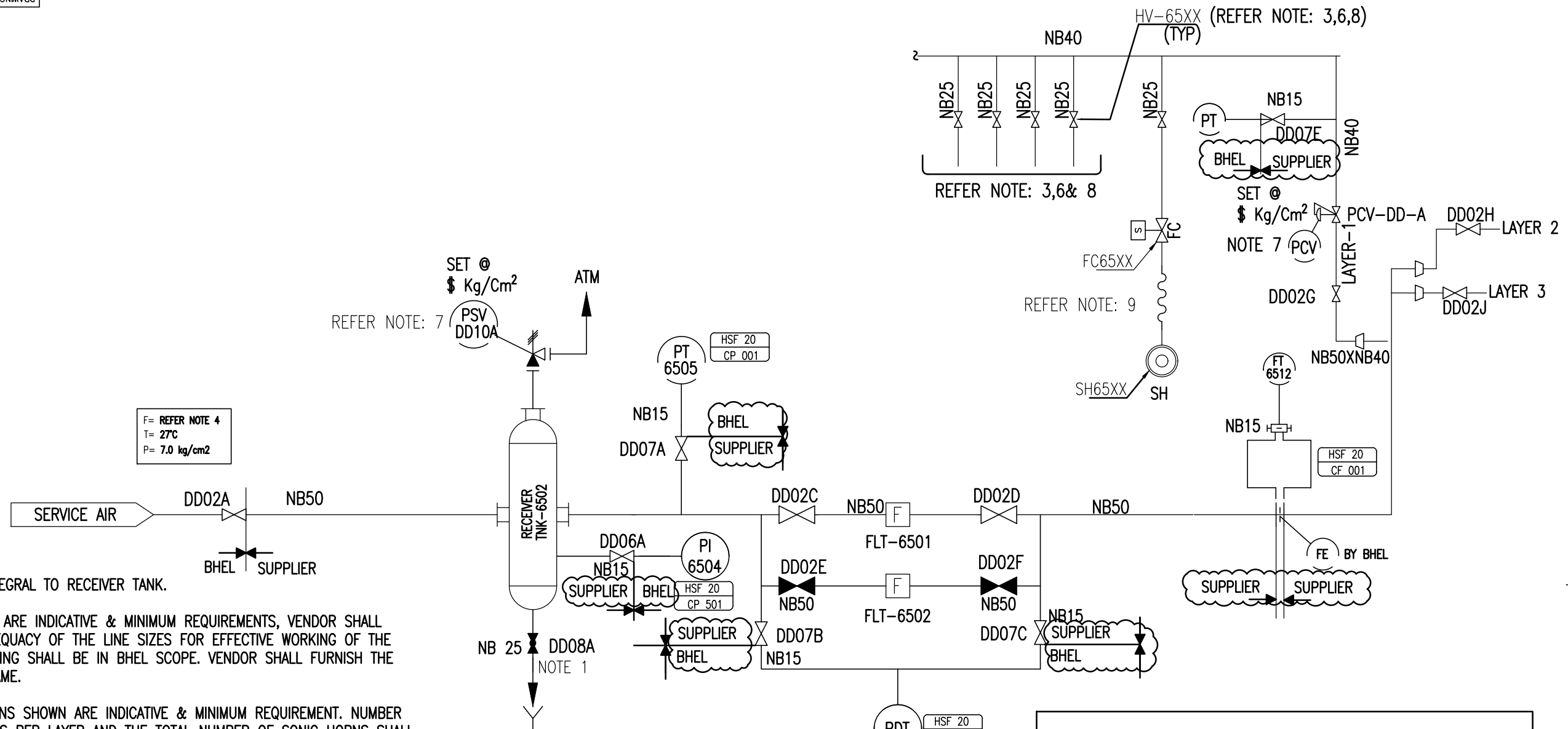


THERE ARE THREE ACTIVE LAYERS (LAYER 1,2&3) & ONE FUTURE LAYER (LAYER 4) PER REACTOR.
THERE ARE TWO REACTORS (REACTOR A & B) PER BOILER.

- NOTES:
1. THERMAL SAFETY SHIELD.
 2. VENDOR TO ADEQUATELY SIZE THE PRESSURE RELIEF VALVE WITH APPLICABLE STANDARDS AND MENTION THE SIZE IN THE OFFER. (\$)- PRESSURE RELIEF VALVE INTEGRAL TO ASH SWEEPER BODY. VENDOR SHALL SPECIFY THE SET PRESSURE.
 3. ALL PIPE SIZES ARE PRELIMINARY & MINIMUM REQUIREMENTS, VENDOR SHALL CHECK AND CONFIRM THE LINE SIZES FOR EFFECTIVE WORKING OF THE EQUIPMENT. PIPING SHALL BE IN BHEL SCOPE. VENDOR SHALL FURNISH THE BOM OF THE SAME.
 4. THE ASH SWEEPERS SHOWN ARE INDICATIVE & MINIMUM REQUIREMENTS ONLY. NUMBER OF ASH SWEEPERS PER LAYER AND THE TOTAL NO OF ASH SWEEPERS SHALL BE DECIDED BY VENDOR(WITH MINIMUM REQUIREMENTS) AND THE BASIS OF SELECTION SHALL BE SUBMITTED BY VENDOR.
 5. FLEX HOSE FROM SOLENOID VALVE TO ASH SWEEPER ASSEMBLY; NO HARD PIPE.
 6. TOTAL AIR FLOW REQUIRED FOR DE-DUSTING SHALL BE FURNISHED BY VENDOR. HOWEVER, THE SAME SHOULD BE LESS THAN VALUE SPECIFIED IN DOCUMENT SCR/DD/PG/001.
 7. TAG NUMBERS SHOWN FOR REACTOR A WITH PREFIX "67"YY; WHEREAS FOR REACTOR B PREFIX "68" YY SHALL BE USED.
 8. DEPENDING ON THE FINAL QUANTITY OF ASH SWEEPERS, THE "YY" "ZZ" IN TAG NUMBERS TO BE SUITABLY NUMBERED BY VENDOR AS 01,02 ETC.
 9. ALL EQUIPMENT, INSTRUMENTS AND THEIR ROOT VALVES TO BE SUPPLIED BY VENDOR AS PER MARKED SCOPE.

CAUTION: The information on this drawing is property of Bharat Heavy Electricals Ltd. It shall not be used directly or indirectly in any way detrimental to the interest of the company.		TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT	
DEPT FS CODE 129		Bharat Heavy Electricals Ltd UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014	
ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)
129	1st Angle	-	NA
TITLE		REF TO ASSY / OLD DWG	
P&ID FOR ASH SWEEPER SYSTEM		NA	
DRAWING NO :		REV	
3-SR-500-00075		00	

REV	DATE	ALTERED :
01		CHD & APPD:
ZONE		



NOTES:

- AUTO DRAIN INTEGRAL TO RECEIVER TANK.
- ALL PIPE SIZES ARE INDICATIVE & MINIMUM REQUIREMENTS, VENDOR SHALL CHECK FOR ADEQUACY OF THE LINE SIZES FOR EFFECTIVE WORKING OF THE EQUIPMENT. PIPING SHALL BE IN BHEL SCOPE. VENDOR SHALL FURNISH THE BOM OF THE SAME.
- THE SONIC HORNS SHOWN ARE INDICATIVE & MINIMUM REQUIREMENT. NUMBER OF SONIC HORNS PER LAYER AND THE TOTAL NUMBER OF SONIC HORNS SHALL BE DECIDED BY VENDOR (WITH MINIMUM REQUIREMENT) AND THE BASIS OF SELECTION SHALL BE SUBMITTED BY VENDOR. TAG NUMBERS SHALL BE NAMED ACCORDINGLY.
- TOTAL AIR FLOW REQUIRED FOR DE-DUSTING SHALL BE FURNISHED BY VENDOR. HOWEVER, THE SAME SHOULD BE LESS THAN VALUE SPECIFIED IN DOCUMENT SCR/DD/PG/001.
- ALL EQUIPMENT, INSTRUMENTS AND THEIR ROOT VALVES TO BE SUPPLIED BY VENDOR AS PER MARKED SCOPE.
- TAG NUMBERS SHOWN ARE FOR REACTOR A WITH PREFIX "65"XX; WHEREAS FOR REACTOR B PREFIX "66" XX SHALL BE USED.
- VENDOR TO ADEQUATELY SIZE THE PRESSURE RELIEF VALVE WITH APPLICABLE STANDARDS AND MENTION THE SIZE IN THE OFFER.
(\$) - PRESSURE RELIEF VALVE INTEGRAL TO ASH SWEEPER BODY. VENDOR SHALL SPECIFY THE SET PRESSURE .
- DEPENDING ON THE FINAL QUANTITY OF SONIC HORNS, THE "XX" IN TAG NUMBERS TO BE SUITABLY NUMBERED BY VENDOR AS 19,20,21., ETC.
- FLEX HOSE FROM SOLENOID VALVE TO ASH SWEEPER ASSEMBLY; NO HARD PIPE.

F= REFER NOTE 4
T= 27°C
P= 7.0 kg/cm²

THERE ARE THREE ACTIVE LAYERS (LAYER 1,2&3) & ONE FUTURE LAYER (LAYER 4) PER REACTOR.
THERE ARE TWO REACTORS (REACTOR A & B) PER BOILER.

CAUTION: The information on this drawing is the property of Bharat Heavy Electricals Ltd. It shall not be used directly or indirectly in any way detrimental to the interest of the company.		TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT					
		Bharat Heavy Electricals Ltd UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014		DRN	NAME	SIGNATURE	DATE
		355-055	SRINIVASU A	-sd-	28.04.2023		
		CHD	SRINIVASU A	-sd-	28.04.2023		
DEPT	FS	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)	REF TO ASSY / OLD DWG	
129					NA	NA	
TITLE						DRAWING NO :	REV
P&ID FOR SONIC HORN SYSTEM						3-SR-500-00076	00



SCR/DD/PG/001 REV00

DE-DUSTING SYSTEM /PERFORMANCE GUARANTEE

The vendor shall provide robust catalyst de-dusting system considering very high ash content of Indian coals. Vendor shall establish/ recommend de-dusting device frequency and their performance tuning based on the actual operation through controlled tests/measurements. Cleaning effectiveness shall target recovery, as measured through gas pressure drop and visual inspection, up to a near pressure drop value with reference to completely clean reactor as measured at the time of commissioning.

DE-DUSTING SYSTEM PERFORMANCE GUARANTEE DATA

Sl. No	DESCRIPTION	UNIT	PERFORMANCE GUARANTEE
1.	The operating Sonic horn's sound level within the reactor at any point	dBA	>125 dBA at all loads
2.	Exterior reactor noise level at 1 meter from the sonic horn/ash sweeper #	dBA	<85 dBA at all loads
3.	Catalyst surface cleaning requirement	-	Catalyst surface shall be free of ash accumulations that would harm or cause loss of catalyst performance.
4.	Max pressure drop across catalyst layers		BMCR WC- Guarantee point
a.	Max pressure drop across initial catalyst charge (Dirty)	mmwc	25.2 (for 3 layers)
5a	Maximum service air consumption for one unit (Service air pressure 7 kg/cm2(g) at ambient temperature)	Nm ³ /hr	< 350

- Sonic horn and Ash sweeper vendor to suggest suitable insulation to achieve the above mentioned sound level.

Supplier's sign and seal

BHEL		SCHEDULE OF VALVES AND FITTINGS- SCR/1728/VALVE/001											
PGMA: SR-500		CUSTOMER : M/s UPRVUNL PROJECT: PANKI THERMAL POWER EXTENSION PROJECT - 1 X 660 MW						CUST. NO :1728			REFERENCE SCHEME DWG NO:0-SR-056-00022,3-SR-500-00075,3-SR-500-00076		
CATALYST DE-DUSTING SYSTEM													
S.NO	TAG NO	SERVICE DESCRIPTION	VALVE TYPE	SIZE/NB/ NCH	OPERATION	MAX.WORKING PARAMETER		BODY MAT	BODY RATING	END CONN	MAKE	QTY PER BLR	Remarks
						PR	TEMP						
1	DD02A	ISOL FOR RECIEVER TANK	GATE	50	HAND	7	27	CS	C800	SW	BHEL	1	
2	DD10A	PRESSURE SAFETY VLV	ANGLE RELIEF	*	SELF	7	27	CS	C300	FLANGED	SUPPLIER	1	*SUPPLIER TO FILL
3	DD08A	RECEIVER TANK DRN ISOL	GLOBE	25	HAND	7	27	CS	C800	SW	SUPPLIER	1	
4	DD06A	PI INST ISOL	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
5	DD07A	PT INST ISOL	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
6	DD02C	FILTER ISOL IN	GATE	50	HAND	7	27	CS	C800	SW	SUPPLIER	1	
7	DD02D	FILTER ISOL O/L	GATE	50	HAND	7	27	CS	C800	SW	SUPPLIER	1	
8	DD02E	FILTER ISOL IN	GATE	50	HAND	7	27	CS	C800	SW	SUPPLIER	1	
9	DD02F	FILTER ISOL O/L	GATE	50	HAND	7	27	CS	C800	SW	SUPPLIER	1	
10	DD07B	PDT ISOL VLV IN	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
11	DD07C	PDT ISOL VLV O/L	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
12	DD02G	SONIC HORN REACTOR-A LAYER 1 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
13	DD-A	SELF REGULATING VLV REACTOR-A LAYER 1	REG	40	SELF	7	27	CS	C300	FLANGED	SUPPLIER	1	
14	DD02H	SONIC HORN REACTOR-A LAYER 2 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
15	DD-B	SELF REGULATING VLV REACTOR-A LAYER 2	REG	40	SELF	7	27	CS	C300	FLANGED	SUPPLIER	1	
16	DD02J	SONIC HORN REACTOR-A LAYER 3 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
17	DD-C	SELF REGULATING VLV REACTOR-A LAYER 3	REG	40	SELF	7	27	CS	C300	FLANGED	SUPPLIER	1	
18	DD07E	PT INST ISOL	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
19	DD07F	PT INST ISOL	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
20	DD07G	PT INST ISOL	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
21	DD02B	ASH SWEEPER ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
22	DD07D	PT INST ISOL	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
23	DD08B	PIPE LINE DRN ISOL- RACTOR A	GLOBE	20	HAND	7	27	CS	C800	SW	SUPPLIER	1	
24	DD02K	ASH SWEEPER REACTOR- A- LAYER 1 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
25	DD02L	ASH SWEEPER REACTOR-A- LAYER 2 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
26	DD02M	ASH SWEEPER REACTOR-A- LAYER 3 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
27	DD02P	SONIC HORN REACTOR-A LAYER 4 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
28	DD-D	SELF REGULATING VLV REACTOR-A LAYER 4	REG	40	SELF	7	27	CS	C300	FLANGED	SUPPLIER	1	
29	DD07H	PT INST ISOL	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
30	DD02N	ASH SWEEPER REACTOR-A- LAYER 4 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
31	DD02A1	ISOL FOR RECIEVER TANK	GATE	50	HAND	7	27	CS	C800	SW	BHEL	1	
32	DD10A1	PRESSURE SAFETY VLV	ANGLE RELIEF	*	SELF	7	27	CS	C300	FLANGED	SUPPLIER	1	*SUPPLIER TO FILL
33	DD08A1	RECEIVER TANK DRN ISOL	GLOBE	25	HAND	7	27	CS	C800	SW	SUPPLIER	1	
34	DD06A1	PI INST ISOL	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
35	DD07A1	PT INST ISOL	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
36	DD02C1	FILTER ISOL IN	GATE	50	HAND	7	27	CS	C800	SW	SUPPLIER	1	
37	DD02D1	FILTER ISOL O/L	GATE	50	HAND	7	27	CS	C800	SW	SUPPLIER	1	
38	DD02E1	FILTER ISOL IN	GATE	50	HAND	7	27	CS	C800	SW	SUPPLIER	1	
39	DD02F1	FILTER ISOL O/L	GATE	50	HAND	7	27	CS	C800	SW	SUPPLIER	1	
40	DD07B1	PDT ISOL VLV IN	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
41	DD07C1	PDT ISOL VLV O/L	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
42	DD02G1	SONIC HORN REACTOR-B LAYER 1 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
43	DD-A1	SELF REGULATING VLV REACTOR-B LAYER 1	REG	40	SELF	7	27	CS	C300	FLANGED	SUPPLIER	1	
44	DD02H1	SONIC HORN REACTOR-B LAYER 2 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
45	DD-B1	SELF REGULATING VLV REACTOR-B LAYER 2	REG	40	SELF	7	27	CS	C300	FLANGED	SUPPLIER	1	
46	DD02J1	SONIC HORN REACTOR-B LAYER 3 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
47	DD-C1	SELF REGULATING VLV REACTOR-B LAYER 3	REG	40	SELF	7	27	CS	C300	FLANGED	SUPPLIER	1	
48	DD07E1	PT INST ISOL	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
49	DD07F1	PT INST ISOL	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
50	DD07G1	PT INST ISOL	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
51	DD02B1	ASH SWEEPER ISOL REACTOR B	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
52	DD07D1	PT INST ISOL	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
53	DD08B1	PIPE LINE DRN ISOL- RACTOR B	GLOBE	20	HAND	7	27	CS	C800	SW	SUPPLIER	1	
54	DD02K1	ASH SWEEPER REACTOR-B-LAYER 1 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
55	DD02L1	ASH SWEEPER REACTOR-B-LAYER 2 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
56	DD02M1	ASH SWEEPER REACTOR-B-LAYER 3 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
57	DD02P1	SONIC HORN REACTOR-B LAYER 4 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
58	DD-D1	SELF REGULATING VLV REACTOR-B LAYER 4	REG	40	SELF	7	27	CS	C300	FLANGED	SUPPLIER	1	

S.NO	TAG NO	SERVICE DESCRIPTION	VALVE TYPE	SIZE/NB/ NCH	OPERATION	MAX.WORKING PARAMETER		BODY MAT	BODY RATING	END CONN	MAKE	QTY PER BLR	Remarks
						PR	TEMP						
59	DD07H1	PT INST ISOL	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	1	
60	DD02N1	ASH SWEEPER REACTOR-B- LAYER 4 ISOL	GATE	40	HAND	7	27	CS	C800	SW	SUPPLIER	1	
61	FC65XX	SOLENOID ON/OFF VALVE INDIVIDUAL SH	*	*	PNEU	7	27	CS	*	*	SUPPLIER	*	* supplier to fill
62	HV65XX	ISOL VALVE TO INDIVIDUAL SH	GATE	25	HAND	7	27	CS	C800	SW	SUPPLIER	*	* supplier to fill
63	HV67YY	ISOL VAL TO INDIVIDUAL ASW	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	*	* supplier to fill
64	HV67ZZ	ISOL VAL TO INDIVIDUAL PI TO ASW	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	*	* supplier to fill
65	PSV67YY	PRESSURE SAFETY VALVE	ANGLE RELIEF	*	SELF	7	27	CS	C800	FLANGED	SUPPLIER	*	* supplier to fill
66	AS67YY	SOLENOID ON/OFF VALVE INDIVIDUAL ASW	*	*	PNEU	7	27	CS	*	*	SUPPLIER	*	* supplier to fill
67	FC66XX	ON/OFF VALVE INDIVIDUAL SH	*	*	PNEU	7	27	CS	*	*	SUPPLIER	*	* supplier to fill
68	HV66XX	ISOL VALVE TO INDIVIDUAL SH	GATE	25	HAND	7	27	CS	C800	SW	SUPPLIER	*	* supplier to fill
69	HV68YY	ISOL VAL TO INDIVIDUAL ASW	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	*	* supplier to fill
70	HV68ZZ	ISOL VAL TO INDIVIDUAL PI TO ASW	GATE	15	HAND	7	27	CS	C800	SW	SUPPLIER	*	* supplier to fill
71	PSV68YY	PRESSURE SAFETY VALVE	ANGLE RELIEF	*	SELF	7	27	CS	C800	FLANGED	SUPPLIER	*	* supplier to fill
72	AS68YY	ON/OFF VALVE INDIVIDUAL ASW	*	*	PNEU	7	27	CS	*	*	SUPPLIER	*	* supplier to fill

NOTE: VALVES WITH S.NO 61-72 HIGHLIGHTED ABOVE PERTAIN TO LAYER 1 OF ONE REACTOR ONLY. THERE ARE TWO REACTORS IN TOTAL.
SUPPLIER TO FURNISH VALVES SUITABLY FOR LAYERS 1 TO 4 OF REACTORS A AND B.

ANNEXURE-P
PRICE BREAK UP FOR THE MAJOR ITEMS

Sagadhi(1731) -SCR De-dusting system.

Bidder to fill up quantity and %price break up for the below mentioned 9 Sl. Nos.

S. No	Item	Quantity for a boiler	Unit	% Price Break up
1	Ash Sweeper assembly		No	
2	Ash Sweeper Nozzle		No	
3	Thermo safety shield		No	
4	Solenoid valve pneumatic accessories Ash sweeper		No	
5	Sonic Horn 75 HZ		No	
6	Sonic Horn mounting arrangement		No	
7	Solenoid valve with pneumatic accessories for sonic horn		No	
8	Air receiver tank with accessories like safety valve		No	
9	Valves & fittings including hoses		No	
			Total	100%