
TECHNICAL SPECIFICATION

FOR

MIST ELIMINATOR

CONFIDENTIAL

CUSTOMER : NTPC LIMITED
PROJECT : BARH-I (3X660 MW)
APPLICATION : FLUE GAS DESULPHURIZATION SYSTEM



BHARAT HEAVY ELECTRICALS LIMITED
(A GOVT OF INDIA UNDERTAKING)
Flue Gas Desulphurization Group
Ranipet



TECHNICAL SPECIFICATION OF MIST ELIMINATOR – NTPC BARH-I (3X660MW)

BARH-I:FGD:MISTEL:R00

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BIDDER SIGN WITH SEAL AND DATE:



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1.0 PROJECT INFORMATION:

Barh Stage-I Super Thermal Power Station (3X660 MW) is being set up by NTPC near Barh Town in Patna District of the Indian State of Bihar.

The capacity of the project is 1980 MW comprising of three (3) units of 660 MW each

a.	Owner	NTPC
b.	Buyer	BHEL, Ranipet
c.	Process/Application	Flue Gas Desulphurization

A) SITE CONDITIONS

Guarantee point

1.	Ambient Temperature and Relative Humidity		
	Ambient Temperature	:	27 deg C
	Relative Humidity	:	60 %

Design point

2.	Ambient Temperature and Relative Humidity		
	Ambient Temperature (Design)	:	45 deg C
	Relative Humidity	:	60 %

Note:

1) Guarantee site conditions shall apply for the Guarantee Values as well as for the Guarantee test/Performance test

Equipment and Material must be suitable for the range of ambient site conditions

B) PROJECT LOCATION AND APPROACH

a.	State/Division	Bihar
b.	District	Patna



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2.0 APPLICABLE CODES & REGULATIONS

The design of Mist Eliminators shall conform to the latest edition of International codes accepted by the Buyer according to good engineering practice.

List of codes/standards recommended: (The list is not exhaustive)

S.No	Description	Material	Design & others
1	Piping	IS, AISI, ASTM, ASME, DIN, EN, BS or Equivalent	IS, AFNOR, ANSI, API, ASME, ASTM, AWWA, BS, DIN, EN, EJMA, Manufacturer's standard
2	Machinery	IS, AISI, ASTM, ASME, DIN, EN, BS or Equivalent	IS, AFNOR, AFBMA, AGMA, ANSI, API, ASTM, AWS, BS, DIN, IEC, HI, HEI, ISO, NEC, NEMA, EN, TEMA, VDI, Manufacturer's standard
3	Instrumentation	IS, AISI, ASTM, ASME, DIN, EN, BS or Equivalent	IS, AFNOR, ANSI, API, ASME, BS, DIN, EN, IEC, IEEE, ISA, ISO, NC, Manufacturer's standard
4	Electrical	AISI, ASTM, ASME, DIN, EN, BS or Equivalent	IS, BS, VDE, IEC, EN, ANSI, IEEE, NEMA
5	Civil	IS, AISI, ASTM, ASME, DIN, EN, BS or Equivalent	IS, AFNOR, ASCE, ASNT, BS, DIN, EN, ANSI, ACI, AISC, AWS, SSPC, Manufacturer's Standard
6	Structural Steel	SA/IS2062	BS/EN 1993 (Eurocode-3) or Equivalent international codes.
7	Performance Test		ASME PTC 40, JIS, EPA, Manufacturer's standard.

The design and materials shall conform to the requirements of applicable codes and regulations of the latest edition. The design, manufacture, installation and testing of the Mist Eliminator shall follow the latest applicable Indian/International (AISI / ASME/EN/Japanese) Standards. GB standards are not acceptable.

**3.0 INTENT OF SPECIFICATION**

This specification covers the minimum requirements for the complete design, material, manufacturing, shop inspection, testing at the manufacturer's works, supervision of erection & commissioning and performance testing of Mist Eliminators along with accessories which is to be furnished in the Flue Gas Desulphurization plant of BARH-I PROJECT(3X660MW)project. The following points may be noted.

- a. There are 3 units of each 660 MW and each unit is envisaged with one FGD system. Each FGD Absorber system will be provided with one Three Stage Mist Eliminator.
- b. Bidder shall assume full unit responsibility for the entire equipment assembly and make all possible efforts to comply strictly with the requirements of this specification and other specifications/attachments to inquiry/order.
- c. In case, deviations are considered essential by the Bidder (after exhausting all possible efforts), the same shall be separately listed in the Bidder's proposal under separate section, titled as "List of Deviations/Exceptions to the Enquiry Document (**Annexure-IV**)". In case of NIL deviation, bidder has to specify "NIL Deviation" in Annexure-IV.
- d. Any deviation, not listed under the above section, even if reflected in any other portion of the proposal, shall not be considered applicable.
- e. No deviation or exception shall be permitted without the written approval of the purchaser.
- f. Compliance to this specification shall not relieve the Bidder of the responsibility of furnishing equipment and accessories/auxiliaries of proper design, materials and workmanship to meet the specified start up and operating conditions.
- g. In case, the Bidder considers requirement of additional instrumentation, controls, safety devices and any other accessories/auxiliaries essential for safe and satisfactory operation of the equipment, the same shall be recommended along with reasons in a separate section and include the same in scope of supply.
- h. All accessories, items of work, though not indicated but required to make the system complete for its safe, efficient, reliable and trouble free operation and maintenance shall also be in supplier's scope unless specifically excluded.

4.0 PROVENNESS CRITERIA:

"Bidder should have previous experience of design, manufacture, supply, erection and commissioning / supervised erection & commissioning of the Mist Eliminators for Wet Limestone based FGD system for at least one (1) no. 500/ MW or higher capacity pulverized coal fired power plant such that respective equipment(s) should have been in successful operation for a period not less than One (1) year prior to Part-I (Techno-commercial) bid opening date"

The Bidder shall offer only proven design which meets the Provenness criteria indicated above. Necessary document evidences as per Annexure-I for qualification shall be submitted along with the bid. If bidder doesn't meet the specified provenances criteria, they are denied to participate in this tender.



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5.0 TECHNICAL INFORMATION

Sl. No.	Description	Requirement	
1.	Type	Three stage chevron type (Flat or Roof type)	
2.	Quantity		
i.	Quantity of Mist Eliminators	3 sets (Complete Mist Eliminators & Washing systems).	
3.	Parameters		
i.	Gas flow	Vertical	
ii.	Casing Dimension	Length : 10900 mm	Width : 23900 mm
iii.	Design Pressure of Mist Eliminator Panel	660 mmH ₂ O (G)	
iv.	Max Allowable Pressure drop across Mist Eliminator element	20 mmH ₂ O (G) at Design point	
v.	Design Temperature	• 70 Deg C (Continuous) • 80 – 90 Deg C (30 minutes) • 90 – 100 Deg C (5 min)	
4.	Gas condition at ME Inlet	Guarantee Point	Design Point
i.	Gas Flow Rate (Nm ³ /s-wet)	735.983	814.948
ii.	Gas Flow Rate (m ³ /s-wet)	893.176	1000.084
iii.	Gas Temperature (Deg C)	58.3	62.1
iv.	Density (kg/m ³)	1.02783	1.00164
v.	Operating Pressure at Mist Eliminator inlet (mm H ₂ O (G))	71	81
vi.	Gas Flow Distribution	+ or - 20%	
5.	Gas Composition at ME Inlet		
i.	SO ₂ (Vol%-wet)	0.0021	0.0020
ii.	H ₂ O (Vol%-wet)	18.0221	21.3969
iii.	O ₂ (Vol%-wet)	5.8826	5.6407
iv.	CO ₂ (Vol%-wet)	9.3415	8.95650.
v.	N ₂ (Vol%-wet)	66.75	64.0029
vi.	HCl (ppm-wet)	<3	<3
6.	HF (ppm-wet)	<1	<1
i.	Dust (mg/Nm ³ -wet)	<50	<200
7.	Entrained Mist Condition:		
i.	Mist Concentration at Inlet –at Guarantee & Design Point	200 g/Nm ³ -dry	
ii.	Mist Concentration at Outlet –at Guarantee & Design Point	≤20 mg/Nm ³	



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Sl. No.	Description	Requirement
8.	Mist Composition	
i.	Solid	30 wt.%
ii.	Cl ⁻	23700 ppm
iii.	Mg ²⁺	9960 ppm
iv.	Ca ²⁺	920 ppm
v.	Na ⁺	2100 ppm
vi.	SO ₄ ²⁻	12670 ppm

5.1 WASHING ARRANGEMENT

I.	Washing water condition	
a.	Flow rate - Average	30.5 m ³ /hr *1)
b.	Flow rate – Instantaneous Allowable Max	151 m ³ /hr
c.	Feed Pressure (at inlet of Washing Nozzle)	0.2 MPa (Max)

II.	Washing Method						
		First Stage		Second Stage		Third Stage	
		Front Surface	Back Surface	Front Surface	Back Surface	Front Surface	Back Surface
a.	Total Washing Area m ²	10.9 x 23.9	10.9 x 23.9	10.9 x 23.9	10.9 x 23.9	10.9 x 23.9	10.9 x 23.9
b.	Washing Water Source	Refer Clause 5.2					
c.	Washing Water Average Flow rate m ³ /h	*	*	*	*	*	**
d.	Instantaneous Max Water Flow rate m ³ /h	*	*	*	*	*	**
e.	Duration of One washing for One Divided Section Sec	*	*	*	*	*	**
f.	Time of One washing Cycle (min)	*	*	*	*	*	**
	*Washing method shall be confirmed by the vendor. ** Only for Maintenance *1) shall be finalized by vendor						

Mist Eliminator panel should be same type for all the 3 stages .

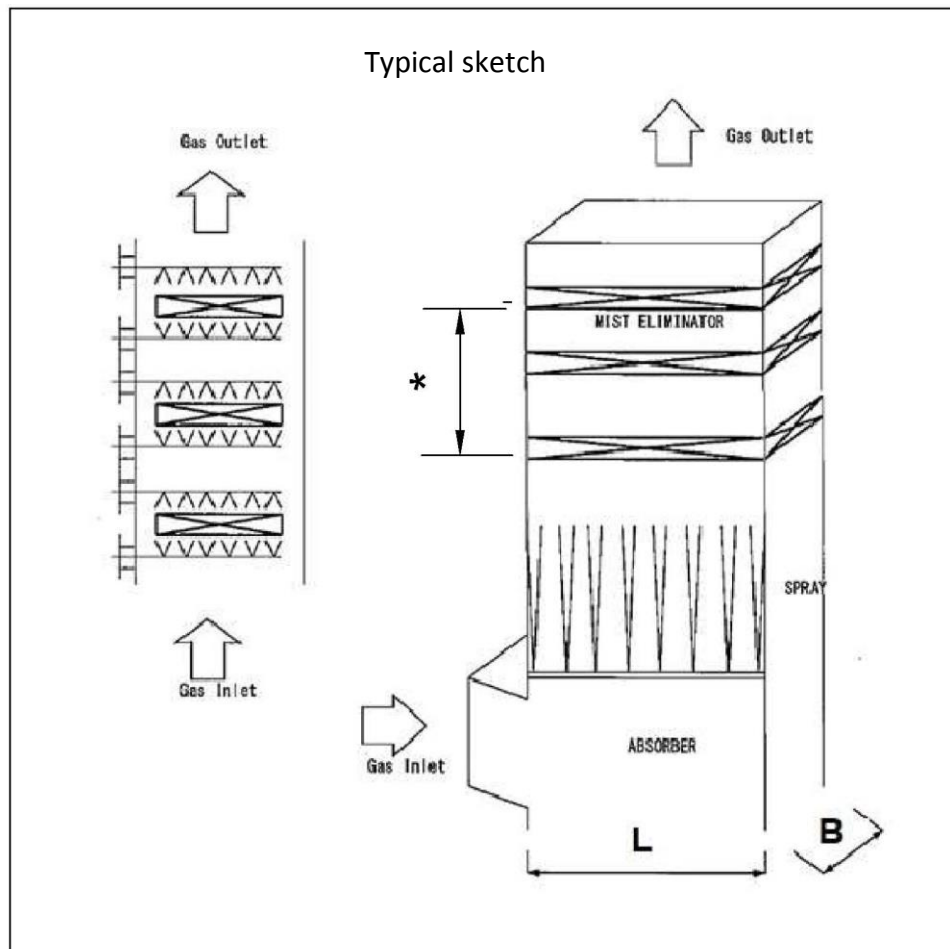


5.2 WATER ANALYSIS

Process water (Raw water) is envisaged for Mist Eliminator washing. Process water analysis is provided below.

S.No	Constituents	Unit	Water quality
1.	Total Cations as CaCO_3	ppm	983
2.	Total Anions as CaCO_3	ppm	983
3.	Calcium as CaCO_3	ppm	493
4.	Magnesium as CaCO_3	ppm	212
5.	Sodium as CaCO_3	ppm	250
6.	Potassium as CaCO_3	ppm	28
7.	Iron as Fe	ppm	1
8.	Total Alkalinity as CaCO_3	ppm	NIL
9.	Chlorides as CaCO_3	ppm	233
10.	Sulphate as CaCO_3	ppm	107
11.	Silica	ppm	15
12.	pH		8.6-9
13.	Turbidity	NTU	50

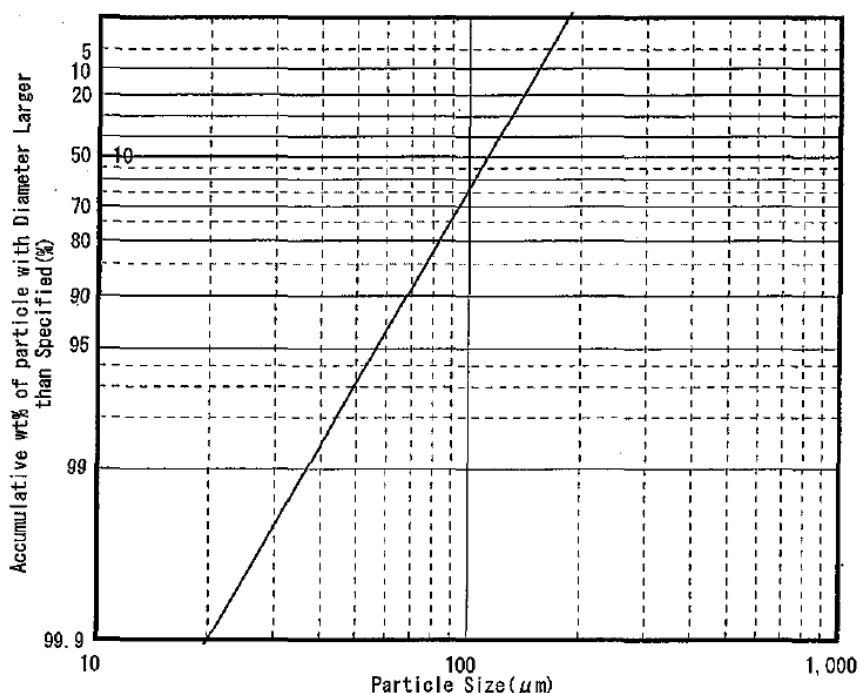
5.3 MIST ELIMINATOR ARRANGEMENT AND MIST PARTICLE SIZE DISTRIBUTION:



L-Length- 10900 mm, B-Breadth-23900 mm

Bidder to decide the spray washing arrangement

*** this distance shall not exceed 4600mm**

Fig. 2 Mist Particle Size Distribution(EXPECTED VALUE)


6.0 SCOPE OF SUPPLY

Scope for the bidders shall include Design, Supply, and Supervision of Erection & Commissioning.

Design: Includes basic engineering, detail engineering, preparation and submission of engineering drawings/calculations/datasheets/quality assurance documents/field quality plans, storage instructions commissioning procedures, operation & maintenance manuals, performance guarantee test procedures and assisting BHEL in obtaining time bound approval from NTPC.

Supply: Includes manufacturing/fabrication, shop floor testing, stage inspections, final inspections, painting & packing.

Supervision of Erection, Testing & commissioning: Includes supervision of erection, Measurement of Outlet Mist concentration at site, training of customer's O&M Personnel and handing over to customer.

Supplier's scope shall cover complete Mist Eliminator unit including sub-systems, start-up spares and special tools (typically) as given below. The scope of supply for Mist Eliminators shall include but not limited to the following:

Sl. No	Scope
1.	Mist Eliminator complete with
	i. Mist Eliminator Panels
	ii. Flushing system complete with all piping, with flanges, washing nozzles, piping supports, fasteners, etc..



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Sl. No	Scope
	iii. Painting and Rust Prevention during shipment and construction
	iv. Supervision of Erection & commissioning at site
	v. Residual droplet content measurement at site using impact method.
	vi. Export packing and Inland Transportation
	vii. Special tools & tackles as applicable
	viii. Mandatory, Erection and start-up spares as applicable
	ix. Installation, operation and maintenance manuals
	x. Any other items required for completeness of the equipment except the items covered in the exclusions.

6.1	CONSTRUCTION FEATURES
a.	To separate the entrained droplets, mist eliminators shall be installed above the absorber spraying zone. Mist Eliminators shall be designed, installed, tested and operated so that high availability and high droplet removal efficiency is guaranteed.
b.	The residual droplet content shall be measured according to clauses in VDI Norm 3679.
c.	Three stage chevron type Mist Eliminators (ME) made of Polysulfone or Stainless Steel (S32205 or better grade) shall be provided at the exit of Absorber. Material grade chosen by the bidder shall be field proven in previous installation for the corrosive and erosive condition prevailing inside FGD absorber.
d.	Provision shall be made for continuous washing of both ends of the first & second stage and the front section of the third stage of Mist Eliminators. Wash water arrangement shall also be provided at the back end of the third stage of Mist Eliminators.
e.	If the Mist Eliminator washing system is designed for cyclic washing of different sections, all the valves required for cyclic shall be motorized or pneumatically operated. The automatic valve for the spray system shall be easily accessible on a platform close to the Mist Eliminator. Entrained Slurry shall be collected by Mist Eliminators downstream of the slurry spray system to avoid carryover of slurry to the Stack.
f.	The ME system shall be equipped with washing and drain provisions, where drains are directed into the absorber. Washing provisions include external and internal piping systems with replaceable nozzles, complete with all piping, instrumentation and controls.
g.	The mist eliminator wash piping shall be constructed of rubber lined carbon steel or glass fiber reinforced plastics. Polypropylene or PVC is also acceptable for mist eliminator wash headers provided bidder has proven experience for the same. Ease of replace ability and placement of the mist eliminator on maintenance platforms is an important requirement. The ME shall be



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	designed to allow for efficient cleaning in process. Test ports shall be provided downstream of the mist eliminator to enable performance testing.
h.	Ease of replace-ability and placement of the mist eliminator on maintenance platforms is an important requirement. The ME shall be designed to allow for efficient cleaning in process. Test ports shall be provided downstream of the mist eliminator to enable performance testing.
i.	The mist eliminator system shall be capable of withstanding high velocity spray water jets typically employed during manual cleanings. The ME shall be constructed in individual cells. The design shall safely avoid ME vibration and/or humming. The individual cells shall be sized so that no more than two maintenance personnel are needed to handle them manually when they are fully scaled or plugged, and the cells shall be capable of passing through the access doors for the mist elimination section.
j.	Easy access for placement and replacement of the mist eliminator shall be incorporated in the design of the mist eliminator arrangement and the absorber vessel.
k.	Walkways shall be arranged and also measures shall be taken as appropriate to permit the internal components to be disassembled and reassembled during repairs without the necessity for time-consuming preparatory work. The headroom shall have a height of more than 2200 mm.
l.	The mist eliminator support beams shall be designed to act as maintenance walkways approximately 300 mm wide and shall allow for a minimum 500 Kg/m ² load. The support beam/walkways shall provide personnel access to all mist eliminator modules, wash headers and wash nozzles.
m.	Adequate number of viewing ports with flushing devices connected to automatically operating washing system shall be delivered at following locations: (i) Upstream of 1st stage (ii) Between 1st and 2nd stage (iii) Downstream of 2nd stage. (iv) Downstream of 3rd stage The regular flushing shall be done in a defined time sequence.
n.	Internal supports for mist eliminator sections, etc. shall be designed to withstand the flooded weight of the supported section. All internal piping support members for mist eliminator and flushing system shall be lined with minimum 2 mm Alloy 59/ C276.
o.	The Mist eliminators and its supporting structure shall be designed to carry sufficient load during maintenance.
p.	The formation of agglomeration, deposition & caking shall be avoided. For mist eliminators the bidder shall submit a cleaning procedure including the required safety measures as part of the inspection concept.
q.	The ME System shall consist of at least three stages and shall be designed to allow efficient cleaning in process. A spray system shall be installed to remove any deposits from the ME. The distance of the spray pipe level from ME panel shall not exceed 700mm. The spray angle of the washing nozzles shall be less than 100 degree for maintaining the washing force.
r.	The demister packages shall be capable of withstanding high velocity spray water jets



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	typically employed during manual cleanings.
s.	The ME shall be designed to allow for efficient cleaning in process. All edges shall be smoothly prepared.
t.	The regular flushing shall be done in a defined time sequence.
6.2	DESIGN FEATURES
a.	The following items shall be Bidder's scope of design • Performance Calculation • Basic Design • Detail Fabrication Drawings • Support Beam Drawing and Loading data for Absorber Design & Strength Calculation • Documents for Fabrication, Inspection, Installation, Shipment and Erection & Maintenance works at site.
b.	Detailed washing procedure for the mist eliminator shall be submitted such as • Minimum washing water pressure (MPa) • Minimum Flow rate (m³/hr) • Washing time schedule and sequence • Nozzle type • No of spray nozzles • Size of header pipes & Valve list
c.	All metallic fasteners which are provided inside the absorber shall be of Alloy 59/ C276.
d.	Mist Eliminator Panel's support shall be designed in consideration of dirty condition of the Mist Eliminator. Design Load of the Mist Eliminator shall be as follows, Mist Eliminator's weight including eliminated liquid weight plus max. allowable pressure drop of the mist eliminator.
e.	The minimum thickness of the Mist Eliminator shall be as per proven practice and bidder to specify the same in the offer.
f.	The spacers to link each panel for restricting the gap between the panels supplied.
g.	Size and location of Manholes which are required for installation and replacement of each segment of the Mist Eliminator shall be provided by the bidder.
h.	Fasteners, spacers and supports shall be provided by bidder to securely hold Mist Eliminator and prevent shifting during operation.
i.	Washing Pipe outside Absorber shall be UV Resistant.



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7.0 GENERAL REQUIREMENTS:

S.No	Description
1.	Metric unit shall be used in the drawings and in the any displays on the equipments. Special attention should be taken that the unit of pressure shall be in dual scales of kPa and kg/cm ² G. For instance the pressure gauges should have dual units indication.
2.	Descriptions in the drawings, in the documents, and in the displays shall be in English
3.	The equipment shall be designed to withstand the corrosive and moist environment in which these are proposed to operate.
4.	Noise level produced by any equipment individually or collectively shall not exceed 85 dB measured at a distance of 1.0 meters horizontally from the source in any direction and 1.5m above operating floor.
5.	Suitable drain connections shall be provided.
6.	The equipment shall be suitable for stable continuous operation.
7.	Limit of connection: The buyer (BHEL) has an intention to minimize interface for utilities as much as possible. The bidder shall consider this requirement in the planning stage of layout for the equipment. The bidder shall provide the header piping for utilities and branch piping to each nozzle. Terminal points for all utilities shall be located at Absorber wall edge at Mist Eliminator elevation. The bidder shall specify all terminal points with tie-in number in the P&ID and submit it in the proposal to confirm the scope of supply.
8.	Service life: Entire equipment except wearing parts shall be designed and fabricated for a minimum service life of 30 years of operation or 200,000 full load operating hours whichever is longer.
9.	Corrosion allowance: Corrosion allowance for entire equipment shall be in accordance with latest applicable international standard.
8	Unless otherwise specified , flanges shall be in accordance with ANSI B16.5 Class 150
10.	Name plate: Nameplate shall be provided indicating the item number and service name. Name plates shall be of 304 Stainless steel plate and placed at a readily visible location. Nameplate of main equipment shall have enough information, which will be confirmed during engineering phase.
11.	Unless otherwise specified, all equipment items where the weight exceeds 15 kg shall be provided with suitable lifting lugs, ears or ring bolts or tapped holes for lifting rings. Minimum shock factor for lifting lugs shall be minimum 2.0. The position of lifting lugs and reference dimension shall be shown on GA and/or outline drawings. NDT shall be conducted for lifting lugs. When any spreader bars are required for lifting and laydown, the bidder shall provide spreader bar with equipment.
12.	Equipment shall be fabricated as much as practical to minimize erection at the site.

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S.No	Description
13.	Two pieces of stainless steel earth lugs shall be provided with equipment diagonally. The position of earth lugs shall be shown on each GA and/or outline drawing.
14.	Washing headers support and its clamping arrangement along with fasteners shall be provided by the bidder.
15.	If the Mist eliminator is in the resonance condition or any vibration problems occur, the bidder shall solve the problems in a timely manner.
16.	Bidder shall provide the mating flanges with the necessary gaskets.
17.	All the surfaces of the carbon steel (if any) should be rust prevented before shipment for the period of at least 12 months for storage and construction.
18.	The list of all Bought out items with makes and country of origin to be mentioned along with offer to be submitted.
19.	Quality Plan to be submitted along with the offer.
20.	During entire period of the project, the bidders shall strictly follow and adhere to the guidelines for effective Health & Safety Management. Supply of safety gears/PPE for bidder's/bidder's sub vendor personnel deputed at site for Supervision of E&C, PG tests etc. shall be in bidder's scope. Also refer to Annexure-IX- Health & Safety Management Manual for complying with requirements whichever is applicable.
21.	Cost towards the participation in discussions/meetings, providing technical assistance during technical discussions/meetings with customer for approval of drawing/documents etc. TA/DA, boarding and lodging to attend these meetings shall be borne by the bidder and shall be inclusive in supply portion.
22.	Material of construction for all equipment/components shall be subject to BHEL/NTPC/NTPC's consultant approval during detail engineering. Accordingly bidder shall consider MOC for all equipment/component as per best engineering practice, global standard and global references.
23.	Bidder to provide sub vendor list and Bidder shall strictly adhere to BHEL/NTPC approved vendor list.
24.	The modalities of inspection (Stage, Final, In-process) shall be finalized during detail engineering after submission of quality assurance plan (QAP). It shall be reviewed by the NTPC/NTPC's consultant and BHEL. Bidder shall follow the procedures of inspection as per the approved QAP. Bidder has to submit the following documents along with inspection call and if any other documents required as per approved QAP. - Raw material inspection certificate - Internal test reports - Statutory certificates as required.

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S.No	Description
	- All inspection & testing shall be carried out based on the following documents: a. Relevant Standards b. Specifications c. Approved drawings d. Data Sheets e. Calibration certificate for all the measuring instruments f. Bidder should also coordinate in getting the MDCC's (Material Dispatch clearance certificate) and all types of IC's (Inspection Certificates) from the customer/customer's consultant along with BHEL.
25.	Any shim plates for erection of equipment / item at site shall be in the scope of bidder.
26.	During detail engineering, bidder to strictly adhere to BHEL/NTPC/NTPC's consultant drawing formats, document numbering, quality plan & FQP formats
27.	The identification and numbering of equipment, systems, items, etc. of supply, as well as of all documents and drawings shall be in accordance with the VGB guideline RDS-PP (Reference Designation System for Power Plants - KKS system).
28.	Complete detail engineering drawings, calculations, selection of components etc. shall be reviewed & subject to approval of BHEL/NTPC/NTPC's consultant during detail engineering
29.	Bidder shall furnish necessary inputs & drawings of all equipment in editable Auto CAD/ MS-Word /Excel format.
30.	During detail engineering, successful bidder shall ensure flow of drawings/documents as per schedule. Any comments from BHEL/NTPC/NTPC's consultant should be addressed timely by the bidder.
31.	Bidder to note that list above is not exhaustive and any work /items required for completing the smooth operation and ensuring satisfactory running of the machines till final hand over to the end user shall also be in the scope of the bidder.
32.	Bidder shall submit the signed and stamped copy of all the pages which constitutes this technical enquiry specification signed by authorized signatory and clearly mentioning each clause under following two categories to avoid any ambiguity in scope understanding & the scope division along with technical offer. a. "Accepted without deviation and considered in scope of work" b. "Not considered in scope of work"



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S.No	Description
8.0	PACKING AND FORWARDING
1.	Proper packing to be ensured. Indigenous Supply: Blower & sub system assembly shall be wrapped in polythene bags & packed in a strong rigid wooden crate. Rain water should not enter into the Blower internals during storage in the outer yard of power plant. Imported Supply: All imported supply should be packed as per Sea worthy packing standards Annexure - VIII. All imported items should have Sea worthy packing. Liberal packing materials and struts shall be provided to arrest rolling and to protect from transit damages.
2.	Cardboard containers shall be enclosed in a solid wooden container
3.	Equipment and process materials shall be packed and semi-knocked down, to the extent possible, to facilitate handling and storage and to protect bearings and other machine surfaces from oxidation. Each container, box, crate or bundle shall be reinforced with steel strapping in such a manner that breaking of one strap will not cause complete failure of packaging. The packing shall be of best standard to withstand rough handling and to provide suitable protection from tropical weather while in transit and while awaiting erection at the site.
4.	Equipment and materials in wooden cases or crates shall be properly cushioned to withstand the abuse of handling, transportation and storage. Packing shall include preservatives suitable to tropical conditions. All machine surfaces and bearings shall be coated with oxidation preventive compounds. All parts subject to damage when in contact with water shall be coated with suitable grease and wrapped in heavy asphalt or tar impregnated paper.
5.	Crates and packing material used for shipping will become the property of owner.(NTPC)
6.	Packing (tare) shall be part of the equipment cost and shall not be subject to return. The packing should ensure integrity and cohesiveness of each delivery batch of equipment during transportation. In case of equipment assemblies and unit's delivery in the packing of glass, plastics or paper the specification of packing with the material and weight characteristics are to be indicated.
7.	Each package should have the following inscriptions and signs stenciled with an indelible ink legibly and clearly: - Destination - Package Number - Gross and Net Weight - Dimensions

**TECHNICAL SPECIFICATION OF MIST ELIMINATOR – NTPC BARH-I (3X660MW)****BARH-I:FGD:MISTEL:R00**

S.No	Description
	e. Lifting places f. Handling marks and the following delivery marking
8.	Each package or shipping units shall be clearly marked or stenciled on at least two sides as follows. BHEL SITE OFFICE, NTPC LIMITED, BARH STAGE-I 3x660 MW, FGD PACKAGE Patna district, Bihar EPC CONTRACTOR: BHARAT HEAVY ELECTRICALS LIMITED INDIA In addition, each package or shipping unit shall have the symbol painted in red on at least two sides of the package, covering one fourth of the area of the side.
9.	Each part of the equipment which is to be shipped as a separate piece or smaller parts packed within the same case shall be legibly marked to show the unit of which it is part, and match marked to show its relative position in the unit, to facilitate assembly in the field. Unit marks and match marks shall be made with steel stamps and with paint.
10.	Each case shall contain a packing list showing the detailed contents of the package. When any technical documents are supplied together with the shipment of materials no single package shall contain more than one set of such documents. Shipping papers shall clearly indicate in which packages the technical documents are contained.
11.	The case number shall be written in the form of a fraction, the numerator of which is the serial number of the case and the denominator the total number of case in which a complete unit of equipment is packed.
12.	Wherever necessary besides usual inscriptions the cases shall bear special indication such as “Top”, “Do not turn over”, “Care” , “Keep Dry” etc. as well as indication of the center of gravity (with red vertical lines) and places for attaching slings (with chain marks)
13.	Marking for Safe handling: To ensure safe handling, packing case shall be marked to show the following: a. Upright position b. Sling position and center of Gravity position c. Storage category d. Fragile components (to be marked properly with a clear warning for safe handling)
14.	Each crate or package is to contain a packing list in a waterproof envelope. All items are to be clearly marked for easy identification against the packing List. All cases, packages



TECHNICAL SPECIFICATION OF MIST ELIMINATOR – NTPC BARH-I (3X660MW)

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S.No	Description
	etc. are to be clearly marked on the outside to indicate the total weight where the weight is bearing and the correct position of the slings are to bear an identification mark relating them to the appropriate shipping documents. All stencil marks on the outside of cases are either to be made in waterproof material or protected by shellac or varnish to prevent obliteration in transit.
15.	The packing slip shall contain the following information:- Customer name, Name of the equipment, Purchase Order number with Date, Address of the delivery site, Name and Address of the Sender, Serial Number of Mist Eliminator & accessories, BHEL item Code, Gross Weight and Net weight of Supplied items.
16.	Prior to transport from manufacturer's work to destination, components of the unit shall be completely cleaned to remove any foreign particles. Flange faces and other machined surfaces shall be protected by an easily removable rust preventive coating followed by suitable wrapping.
17.	All necessary painting, corrosion protection & preservation measures shall be taken as specified in painting schedule. Supplier shall consider the coastal environment zone which is defined as "very severe" during final finishing/shipping.
18.	Successful bidder shall furnish the detail packing /shipment box details with information like packing box size, type of packing, weight of each consignment, sequence no. of dispatch, no. of consignment for each deliverable item against each billing break up units/ billable blocks. Without these details the BBU shall not be approved during detail engineering. Also, complete billing break-up with above mentioned details shall be submitted within 10days of LOI.
19.	All items/equipment shall be dispatched in properly packed condition (i.e. no item shall be dispatched in loose condition such that it becomes difficult to store/identify its location at site at a later stage).
20.	Cases which cannot be marked as above shall have metal tags with the necessary markings on them. The metal tags shall be securely attached to the packages with strong steel binding wire. Each piece, Skid, Case or package shipped separately shall be labelled or tagged properly.
9.0	SUPERVISION OF ERECTION, TESTING AND COMMISSIONING
	ERECTION
1.	The erection of Mist Eliminator and washing system will be done by owner as per Erection Manual and check List. However, the bidder shall make one visit per boiler for the supervision of erection, pre-commissioning & post- commissioning check-up, start-up, testing and trial runs of all the items covered under the scope of supply.

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S.No	Description
2.	There will be one visit per boiler and totally there will be 3 visits for 3 boilers. The bidder will be informed well in advance for the visit. Bidder shall include 4 working days per visit in the offer with minimum 3 visits.
3.	TA/DA, Travel expenses, boarding and lodging shall be borne by the bidder and shall be inclusive in supervision portion.
	DROPLET MEASUREMENT AT SITE
1.	Bidder to measure residual droplet at Mist eliminator outlet for both the units at site. The bidder will be informed well in advance for the visit.
2.	Number of visits shall be Three (3). Bidder to complete the test for all the units. TA/DA, travel expense, boarding and lodging shall be borne by the bidder and shall be inclusive in supervision portion.
10.0	EXCLUSION
	The following work associated with the Mist Eliminator will be by BHEL: a. Mist Eliminator Wash Pumps b. Piping from ME Wash pumps to Absorber wall at Mist eliminator elevation. c. Motorized operated valves d. ME Support beams
11.0	INSPECTION AND TESTING
	The General inspection requirements to be considered are as below:
1.	Bidder shall furnish written copies of shop production, fabrication and quality test procedures and drawings for review by BHEL/NTPC prior to manufacture. Inspection of above mentioned tests by BHEL representative at bidder's works is envisaged.
2.	The Bidder shall furnish performance test procedure along with measurement standard. The procedure will be reviewed and approved by the BHEL/NTPC.
3.	Final inspection and release by the BHEL/NTPC is a mandatory requirement unless specially waived.
4.	Acceptance tolerance of actual versus guaranteed performance for Droplet removal efficiency and Pressure drop shall be as per applicable standard.
5.	Mist Eliminator shall not be released for shipment, until shop tests data have been approved by Owner.
6.	Bidder should furnish performance guarantee as per applicable standard guarantee for



TECHNICAL SPECIFICATION OF MIST ELIMINATOR – NTPC BARH-I (3X660MW)

BARH-I:FGD:MISTEL:R00

S.No	Description									
	the design, manufacture, material and safe operation of the equipments.									
7.	BHEL/NTPC shall witness the test at Bidder's works and a notice of minimum three (3) weeks shall be given for attending the inspection.									
8.	Bidder to arrange all calibrated gauges, Instruments during inspection.									
9.	Bidder to arrange Instruments and all accessories for the measurement at site using Impact method.									
10.	The performance test & droplet measurement may be carried out at site for Guarantee conditions and shall be converted to the design condition.									
12.0	SPARES,TOOLS & TACKLES									
12.1	START UP & COMMISSIONING SPARES									
	Start-up & Commissioning Spares shall be part of the main supply of the Mist Eliminator & sub system. Start-up & commissioning spares are those spares which may be required during the start- up and commissioning of the equipment/system. All spares required for successful operation till commissioning of Mist Eliminator and accessories. shall come under this category. Bidder shall provide an adequate stock of such start up and commissioning spares to be brought by him to the site for the equipment erection and commissioning. The spares must be available at site before the equipment's are energized.									
12.2	RECOMMENDED SPARES									
	Bidders shall also furnish the recommended spares list along with the offer required for 3 years of normal operation of the plant and should be independent of the list of the mandatory spares. Prices of recommended spares will not be used for evaluation of the bids. The price of these spares will remain valid up to 6 months after placement of Notification of Award for the main equipment.									
12.3	MANDATORY SPARES:									
	Bidder to quote for below mentioned mandatory spares with break up price. <table><tr><th>S.no</th><th>Item</th><th>Quantity</th></tr><tr><td>1</td><td>Absorber Mist eliminator nozzles</td><td>10% of each type and size</td></tr><tr><td>2</td><td>Mist Eliminator</td><td>5% of each type and size/configuration</td></tr></table> Bidder shall quote for the “Mandatory spares”, and it will be considered for L1 evaluation. Initial spare parts items shall be handed over separately and shall not be mixed with the supply of the main equipment parts. Spares shall be sent in pre-decided lots in containers/secure boxes. All boxes/containers are to be distinctly marked in red color with boldly written “S” mark on each face of the containers. Spares shall not be dispatched before dispatch of corresponding main equipments. Each item shall be labelled in English and be packed against damage and sealed to prevent deterioration from corrosion. The protection shall be sufficient for a minimum of 10	S.no	Item	Quantity	1	Absorber Mist eliminator nozzles	10% of each type and size	2	Mist Eliminator	5% of each type and size/configuration
S.no	Item	Quantity								
1	Absorber Mist eliminator nozzles	10% of each type and size								
2	Mist Eliminator	5% of each type and size/configuration								



TECHNICAL SPECIFICATION OF MIST ELIMINATOR – NTPC BARH-I (3X660MW)

BARH-I:FGD:MISTEL:R00

S.No	Description
	years' storage in a dry weatherproof building. All spares supplied under this contract shall be strictly inter-changeable with the parts for which they are intended for replacements. All the Initial spares shall be manufactures along with the main equipment components as a continuous operation as per same specification and quality plan.
12.4	SPECIAL TOOLS & TACKLES:
	Any special tools & tackles required for the entire equipment to disassemble, assemble or maintain the units, they shall be included in the quotation and furnished as part of the initial supply. List of special tools & tackles shall be decided by bidder as per his proven practice. When special tools are provided, they shall be packaged in separate, boxes with lugs and marked as "Special Tools for (tag / item number)." Each tool shall be stamped or tagged to indicate its intended usage. Levers and eye bolts for the removal of parts to be serviced shall be submitted with special tools.
13.0	PERFORMANCE GUARANTEE
a.	All performance tests for Mist Eliminators shall be carried out in accordance with any latest international codes/standards. 1) The mist eliminator outlet droplet content shall be guaranteed to be $\leq 20 \text{ mg/Nm}^3$-dry @ 6% O₂ dry at absorber outlet measured over a period of 24 hrs. continuous operation. 2) Mist outlet-droplet content shall be measured as per applicable clauses in VDI Norm 3679 and the Contractor shall carry out the tests as per the test procedure approved by the Employer. 3) Bidder shall furnish Performance guarantee for the design, manufacture, material, safe and trouble-free operation of the Mist Eliminator and its accessories 4) Maximum Pressure drop across M/E at Design Point condition i.e. 20 mm H₂O (G) is to be guaranteed. It shall be measured at Guarantee point conditions in site and shall be converted to the design condition. 5) The Bidder shall ensure a design of the equipment to achieve an average target availability of 98% for 120 days and average target availability of 95% for 1 year 6) Noise level $\leq 85 \text{ dB (A)}$ at 1m horizontal distance from equipment/enclosures and 1.5m above operating floor is to be guaranteed. 7) In the event that the performance test is unsuccessful in meeting performance guarantees, bidder shall take necessary remedial action at his cost and the performance test shall be repeated.
14.0	WARRANTY
1.	The Bidder warrants that the equipments/items shall be free from defects in the design,



TECHNICAL SPECIFICATION OF MIST ELIMINATOR – NTPC BARH-I (3X660MW)

BARH-I:FGD:MISTEL:R00

S.No	Description
	engineering, materials and workmanship of the Plant and Equipment supplied and of the work executed. The Defect Liability Period shall be 36 months from the date of supply or 24 months from the date of commissioning, whichever first occurs. If during the Defect Liability Period any defect should be found in the design, engineering, materials and workmanship of the Plant and Equipment supplied or of the work executed by the Bidder, the Bidder shall promptly, in consultation and agreement with BHEL regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good (as the Bidder shall, at its discretion, determine) such defect as well as any damage to the Facilities caused by such defect..
2.	In case of failure of the equipment to meet the guarantee, NTPC/BHEL reserves the right to reject the equipment. However, NTPC/BHEL reserves the right to use the equipment until new equipment supplied by bidder meets the guaranteed requirement.
15.0	FIRST FILL OF CONSUMABLES:
1.	Bidder's scope shall also include supply and filling of all chemicals, reagents, resins, lubricants, grease, filters and consumable items for operation up to COD including top up requirements at the time of issuance of PAC/declaration of COD. All lubricants proposed for the plant operation shall be suitable for all operating and environmental conditions that will be met on site consistent with good maintenance procedures as instructed in the maintenance manuals.
2.	Detailed specifications for the lubricating oil, grease, gases, servo fluids, control fluids, chemicals including items qualities and quantities required per month of the plant operation for the NTPC/BHEL's approval herein shall be furnished within 2 months of placement of Order. On completion of erection complete list of bearings/equipment giving their location and identification marks shall be furnished to BHEL along with lubrication requirements. All types of chemicals, consumables, lubricants and grease shall be readily obtainable locally and the number of different types shall be kept to a minimum. For each type and grade of lubricant recommended, bidder shall list at least three equivalent lubricants manufactured by alternative companies.
16.0	TRAINING
	Successful bidder shall provide comprehensive training for NTPC/BHEL Engineering, O&M, Erection & Commissioning staffs at site covering all aspects of the GDS system - Operation & Maintenance, Troubleshooting etc.
17.0	CONFLICT
	Bidder's equipment shall be designed for and shall meet the service, performance and minimum level of quality requirements specified. Bidder shall be solely responsible for advising BIFPCL in writing of any conflicts between the specifications and Bidder's design, including performance and levels of quality. Bidder agrees that its obligations, liabilities and warranties shall not be diminished or extinguished due to its meeting the

**TECHNICAL SPECIFICATION OF MIST ELIMINATOR – NTPC BARH-I (3X660MW)****BARH-I:FGD:MISTEL:R00**

S.No	Description
	requirements of the Specification.
18.0	DOCUMENTATION
A	DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER
	The Bidder shall submit all documents, drawings, diagrams and all such information, which are necessary to fully understand the offer for techno – commercial evaluation. As a minimum requirement, the documents in Annexure: V shall be furnished to fully describe the scope of work and services offered. The above documents are required for proper evaluation purpose and vendors are requested to comply with above in all respect.
B	DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT
	The Successful bidder shall submit necessary data, documents and drawings for review, approval with requirements specified here under. However as minimum the documents in Annexure: V shall be submitted. Drawings that are reviewed by the NTPC/ BHEL will be returned to bidder with a transmittal letter with any comments and / or questions marked on the drawings or noted in the letter. All comments and questions must be resolved before a resubmission of drawings / documents. If the design has not developed enough to resolve some of the comments or questions, bidder shall place a “hold” on those items or areas of design. NTPC/ BHEL reserves the right to return drawings unprocessed to bidder if there exists any evidence that bidder has not acknowledged all comments and questions. All necessary GA drawings, sections, sub-assembly drawings, specifications of main and sub components and necessary set of operation & maintenance manual as asked by NTPC must be furnished by bidder in soft and hard copy forms. For all documents softcopy format shall be searchable pdf, however in addition all drawings, diagrams like P&IDS shall be supplied in ACAD or other editable format and all lists in Excel format. Further break up of technical documents will be discussed during finalization of the purchase contract. Unless agreed otherwise, 10 hard copies and 5 set of electronic copies of all documents are to be submitted in the English language. Electronic Copies shall be submitted in primary original data format (e.g. DOC, XLS, DWG) as well as in a printable non-proprietary document format (e.g. PDF). Especially P&IDs shall be submitted as DWG files and PDF files. Bidder to ensure submission of hard copies as per NTPC requirement for all engineering drg/doc and for all subsequent revisions along with a soft copy through email to concerned project team. However all the engineering related information shall be furnished in soft form to BHEL.



TECHNICAL SPECIFICATION OF MIST ELIMINATOR – NTPC BARH-I (3X660MW)

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19.0 ANNEXURES

ANNEXURE – I

a) REFERENCE LIST as per format shown below. (at least One (1) reference plant details)

S. No.	Project Name , Customer & Plant capacity	Coal fired Yes/ No	Wet Limestone Based FGD Yes/No	Model	Flue gas flow Nm ³ /hr	Size	Outlet Mist Concentration mg/Nm ³	Year of Commg	Qty

NOTE: Performance certificate (End user feedback) or Unpriced PO or contract copy is required for 1 No Reference plant.

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____

BIDDER SIGN WITH SEAL AND DATE:



TECHNICAL SPECIFICATION OF MIST ELIMINATOR – NTPC BARH-I (3X660MW)

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ANNEXURE – II- TECHNICAL DATA SHEET

Sl. No	Description	Data
1.0	GENERAL	
	a. Client	: BHEL-Ranipet
	b. Project	: Barh-i
	c. Ultimate Customer	: NTPC
	d. Location	: Bihar, India
	e. Service	: Continuous
	f. Installation	: In-door
	g. Total number of Mist Eliminators	: 1 no. (Complete ME & Washing system) for Unit - 1
		: 1 no. (Complete ME & Washing system) for Unit - 2
		: 1 no. (Complete ME & Washing system) for Unit - 3
2.0	MANUFACTURER DETAILS	
	a. Model	: Bidder to Provide
	b. Type	: Bidder to Provide
	c. No of stages	: Bidder to Provide
	d. Vane type for Coarse & Fine separators	: Bidder to Provide
	e. Pitch details for Coarse & Fine separators	: Bidder to Provide
	f. Weight data	: Bidder to Provide
	g. Flushing system details	: Bidder to Provide
3.0	OPERATING CONDITION	: Refer Clause: 5.0 , S.No-4
4.0	PERFORMANCE DATA	
	a. Face Velocity m/s	: Bidder to Provide
	b. Pressure Drop hPa(G)	: Bidder to Provide
	c. Limit Drop Size Micron	: Bidder to Provide
	d. Temperature resistance of ME System Deg C	: Bidder to Provide
	e. Performance curve	: Bidder to Provide
	f. Washing sequence & Valve List	: Bidder to Provide
	g. Utility list & required Pump Capacity	: Bidder to Provide
5.0	MATERIALS	
	a. ME Panel	: Bidder to Provide
	b. Washing Pipe	: Bidder to Provide
	c. Washing Nozzles	: Bidder to Provide
	d. Hardwares	: Bidder to Provide



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6.0	INSPECTION AND TESTING		
	a. Material Test certificates	:	[R] [O]
	b. Dimensional & visual inspection	:	[R] [W]
	c. Droplet measurement at site	:	[R] [W]
	[R]: Required, [W]: Witnessed by BHEL/NTPC, [O]: Observed		

7.0 WASHING ARRANGEMENT

7.1	Washing water condition	
a.	Flow rate - Average	
b.	Flow rate – Instantaneous Allowable Max	
c.	Feed Pressure (at inlet of Washing Nozzle)	

7.2	Washing Method						
		First Stage		Second Stage		Third Stage	
		Front Surface	Back Surface	Front Surface	Back Surface	Front Surface	Back Surface
a.	Total Washing Area m ²	10.9 x 23.9	10.9 x 23.9	10.9 x 23.9	10.9 x 23.9	10.9 x 23.9	10.9 x 23.9
b.	Washing Water Source						
c.	Washing Water Average Flow rate m ³ /h	*	*	*	*	*	*
d.	Instantaneous Max Water Flow rate m ³ /h	*	*	*	*	*	*
e.	Duration of One washing for One Divided Section Sec	*	*	*	*	*	*
f.	Time of One washing Cycle (min)	*	*	*	*	*	*
	* Bidder to fill the value Note. 3 rd stage back surface washing - only for Maintenance						

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----

**TECHNICAL SPECIFICATION OF MIST ELIMINATOR – NTPC BARH-I (3X660MW)****BARH-I:FGD:MISTEL:R00****ANNEXURE III- SCHEDULE OF GUARANTEES**

Sl. No	Description	Data
1.	Mist eliminator outlet droplet content mg/Nm ³ at absorber outlet measured over a period of 24 hrs continuous operation.	: Bidder to Provide
2.	Total Pressure drop across M/E at hPa(G) design point condition	: Bidder to Provide
3.	Noise level at a distance of 1.0 meter horizontally from the equipment at site and 1.5 m above operating floor dB(A)	: Bidder to Provide
4.	Equipment Availability (%) Equipment Availability for 120 days % Equipment Availability for 1 year %	: Bidder to Provide : Bidder to Provide

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____

BIDDER SIGN WITH SEAL AND DATE:

**ANNEXURE – IV- LIST OF DEVIATIONS/EXCEPTIONS TO THE ENQUIRY DOCUMENT**

Sl No	Clause No	Page No	Description of Deviation

Note: Enlarge the table to incorporate items. In case of NIL deviation, bidder has to specify “NIL Deviation”.

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----

BIDDER SIGN WITH SEAL AND DATE:

**TECHNICAL SPECIFICATION OF MIST ELIMINATOR – NTPC BARH-I (3X660MW)****BARH-I:FGD:MISTEL:R00****ANNEXURE –V****A) DOCUMENTS TO BE SUBMITTED ALONG WITH THE TECHNICAL OFFER:**

Sl. No.	Description	No of copies With proposal
1.	Specification – Duly signed and stamped by the bidder for compliance to BHEL specification	1
2.	Un priced - Price Sheet	1
3.	Annexure duly filled and signed & stamped	1
4.	Washing Sequence & Valve list	1
5.	Data Sheet	1
6.	Performance curve	1
7.	Proforma Packing List	1
8.	Approximate weight of each skid	1
9.	Reference plant details	1
10.	Utility List & Required Pump Capacity	1
11.	Deviation List	1
12.	General Assembly Drawing	1
13.	Support beam details and loading data	1
14.	Cross-sectional Drawing	1
15.	Sub-Vendor List	1
16.	Scope of Supply	1
17.	Quality Plan	1
18.	Start-up & Commissioning Spares	1
19.	List of Special Tools	1
20.	Delivery Schedule	1
21.	Droplet Measurement procedure	1
22.	WPS & PQR arrangement	1
23.	Man-holes, Sampling ports & Wash Pipe flange location & details	1
24.	P & I Diagram	1
25.	Catalogue	1
26.	Terminal Point details	1
27.	Bill of Materials along with material and code	1

**TECHNICAL SPECIFICATION OF MIST ELIMINATOR – NTPC BARH-I (3X660MW)****BARH-I:FGD:MISTEL:R00****B) DOCUMENTS TO BE SUBMITTED AFTER CONTRACT:**

Sl. No.	Description	No of copies After award of contract	Delivery Time
1.	Utility List & Required Pump Capacity	1	2 weeks after contract
2.	Washing Sequence & Valve list	1	2 weeks after contract
3.	Performance curve	2	2 weeks after contract
4.	GA drawings of each equipment	1	1 month after contract
5.	Cross section detail drawing	1	1 month after contract
6.	Data Sheet	1	2 weeks after contract
7.	Lubricating oil list	1	2 months after contract
8.	Special tools list	1	2 months after contract
9.	Installation and assembly procedure	1	4 months after contract
10.	Inspection and Test Procedure	1	1 month after contract
11.	Inspection & Test record	1	In 2 weeks after test
12.	Inspection Certificate	1	In 2 weeks after test
13.	Sub vendors List	1	2 weeks after contract
14.	Manufacturing Schedule	1	2 weeks after contract
15.	Progress report	1	Every month
16.	Proforma Packing List	1	2 months prior to shipping
17.	Approximate weight of each	1	2 months after contract
18.	Support beam drawing & loading data	2	2 weeks after contract
19.	Strength & performance Calculation	1	2 weeks after contract
20.	Material Test Certificates	2	In 2 weeks after test
21.	Pre Commissioning Check List	2	4 months after contract
22.	Scope of Supply	2	2 weeks after contract
23.	Quality Plan	4	1 month after contract
24.	Operation and Maintenance Manual	• 10 hardcopies and 5 electronic copies in English	4 months after contract
25.	Spare List	1	1 month after contract
26.	Start-up & Commissioning	2	1 month after contract
27.	List of Special Tools	1	1 month after contract

**TECHNICAL SPECIFICATION OF MIST ELIMINATOR – NTPC BARH-I (3X660MW)****BARH-I:FGD:MISTEL:R00**

Sl. No.	Description	No of copies After award of contract	Delivery Time
28.	Delivery Schedule	1	2 weeks after contract
29.	Droplet Measurement	2	1 month after contract
30.	WPS & PQR	2	2 weeks after contract
31.	P & I Diagram	2	2 weeks after contract
32.	Catalogue	2	2 weeks after contract

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----



TECHNICAL SPECIFICATION OF MIST ELIMINATOR – NTPC BARH-I (3X660MW)

BARH-I:FGD:MISTEL:R00

ANNEXURE –VI

TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING (APPLICABLE FOR IMPORTS)

Refer to Specification No: PE-TS-888-100-A001 for detailed specification on Seaworthy packing.

SIGNATURE OF BIDDER

NAME

DESIGNATION

BIDDER SIGN WITH SEAL AND DATE:



ANNEXURE-VII

INSPECTION & TESTING

Refer to all clauses for Inspection & testing requirements.

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____