

TD-106-1
Rev.5

Form No.



**PRODUCT STANDARD
TURBINES & COMPRESSORS
HYDERABAD**

TC-6-2679**Rev.No. 00****SHT 1 OF 29**

This job specification shall be completely filled-in, duly signed by supplier and enclosed along with offer.

OFFER FOR 3X500MW FGD OXIDATION BLOWER

PROJECT: 3X500MW NTPC RAMAGUNDAM STAGE-II

TYPE: _____

REF: _____

Technical Offer

MANUFACTURER: _____

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Revisions:
Refer to record of revisions

Prepared:
DILEEP

Approved:
YVRL

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1.0 APPLICABLE SPECIFICATIONS : TC52545 (Standard specification of FGD Blowers for NTPC Projects)/ ISO 10816-1/ ISO7919-3. In case of conflicts between standard specification TC52545 and job specification TC62679, job specification prevails.

2.0 PROJECT INFORMATION:

NTPC Ramagundam (RSTPS) is a pit-head thermal power station based on the coal supplied from the nearby Singareni Mines of M/s. SCCL and water from Pochampad Dam. The station is located in the Peddapalli district of the Indian state of Telangana. about 60 kms from Karimnagar town and 100 kms from Warangal. Ramagundam Railway station is on the Delhi - Chennai main line. Ramagundam is well connected to Hyderabad by Rajiv Rahadari state highway. The aerial distance from Ramagundam to Hyderabad is 178 km while the road distance between Ramagundam to Hyderabad is 209 km and by train it is 224 Km. Nearest commercial airport is Rajiv Gandhi International Airport, Hyderabad at about 250 km.

a.	Owner	NTPC Ramagundam
b.	Buyer	BHEL, Hyderabad
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 point site condition shall be applicable for performance test at shop/ site
2. Equipment and material must be suitable for the range of ambient conditions.

B) WATER ANALYSIS

The following water to be used for quenching the oxidation air if discharge temperature is more than 70 deg C.

S.No	Constituents	As	mg/l
1.	Calcium	CaCO ₃	316
2.	Magnesium	CaCO ₃	292
3.	Sodium	CaCO ₃	260
4.	Potassium	CaCO ₃	24
5.	Total Cations	CaCO ₃	892
6.	M-Alkalinity	CaCO ₃	120
7.	P-Alkalinity	CaCO ₃	0
8.	Nitrate CaCO ₃	CaCO ₃	8.8
9.	Chloride	CaCO ₃	252
10.	Sulphate	CaCO ₃	160
11.	Total Anions	CaCO ₃	892
12.	Silica	Sio ₂	60
13.	Iron	Fe	0.48
14.	pH Value	-	6.5-6.9

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S.No	Constituents	As	mg/l
15.	Turbidity	NTU	6
16.	Total dissolved solids	Caco3	980
17.	Organic matter (Oxygen absorbed acid permanganate in 4 Hrs)	-	0.1

Note: Vendor to consider worst quality of process water for designing the quenching system.

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 Oxidation blower along with accessories which is to be furnished in the Flue Gas Desulphurization plant of NTPC Ramagundam stage-II 3x500MW project. The following points may be noted.

- There are three units of 500 MW and each unit is envisaged with one FGD system. Each FGD system will be provided with 2 numbers of Oxidation Blower (1 working + 1 standby) which are located inside the Recirculation Pump & Oxidation Blower shed.
- 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.
- The Bidder shall offer only proven design which meets the Provenness criteria indicated in **Annexure-I of TC62679**. Necessary document evidences as per **Annexure-3K of TC62679** for qualification shall be submitted along with the bid. If the Bidder doesn't meet the specified provenness criteria, then the Bidder will not be allowed to participate in the Tender.
- 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 as listed in **Annexure I of TC52545**."
- Any deviation, not listed under the above section, even if reflected in any other portion of the proposal, shall not be considered applicable.
- No deviation or exception shall be permitted without the prior written approval of the purchaser.
- 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.
- 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.
- 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.

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4.0 PROVENNESS CRITERIA:

The Bidders are required to meet the Qualification Requirement (QR) for Oxidation Blower as per **Annexure-I of TC62679** & necessary documents evidence requirement as per **Annexure-3K of TC62679** along with necessary supporting documents. Bidder's offer will be rejected if the bidder fails to meet the Qualification criteria.

5.0 TECHNICAL INFORMATION

Sl. No	Description	Requirement		
1.	Quantity	2 Nos (1 Working + 1 standby) per unit .Total 6 Nos.		
2.	Parameters			
	Operating Points	(1) Design Point	(2) Operating point-1	(3) Guarantee Point
	Blower capacity	9300 Nm³/hr-wet.	4212 Nm³/hr-wet.	3435 Nm³/hr-wet.
	Discharge pressure	9350 mmWC	6790 mmWC	5810 mmWC
	Relative humidity	60%	60%	60%
	Suction temperature	45.0° C	45.0° C	27.0° C
	Atmospheric pressure	992.2 hPa		
	Discharge temperature	<70° C		
	Type of Blower	2x100% electric driven, single stage, integrally geared, single or dual vane Centrifugal type/ Positive displacement (Helical lobe) type with VFD drive, oxidation blowers complete with integral gearbox, lube oil system, instrumentation and accessories. The blower will be used for supplying a variable volume of air to the absorber reaction tank.		
	Duty	1 Blower continuous at any point of time.		
3.	Cooling water			
	Inlet temperature	38° C		
	Outlet temperature	<43° C		
	Pressure loss	<0.05 MPa		
	Supply pressure	0.3 MPa		
4.	Air Composition (Wet)	(1) Design Point	(2) Operating point-1	(3) Guarantee Point
	H ₂ O	5.776 vol%	5.776 vol%	2.15 %
	O ₂	19.79 vol%	19.79 vol%	20.55%
	N ₂	Balance	Balance	Balance
5.	Material of construction			
	Casing	Vendor to provide		
	Shaft	Vendor to provide		
	Impeller	Vendor to provide		
6.	Voltage level for Motors & VFD (If applicable)	a) Up to 0.2KW – Single phase 240V AC/ 3phase 415V AC b) Above 0.2 KW and up to 200 KW- 3phase 415V AC c) Above 200 KW and up to 1500 KW- 3phase 3.3kV AC d) Above 1500KW-11 kV e) For VFD driven motor, voltage rating of motor shall be as per clause 3.03.00 of VFD specification at Annexure VII of TC52545.		
7.	Air filter filtering efficiency	Vendor to provide along with name of vendor supplying the Air Filter		
8.	Blower Driver	HT Motor in BHEL BHOPAL Scope		
9.	Cooling system for reducing	Quenching/Cooling arrangement with water injection arrangement to		

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Sl. No	Description	Requirement
	the temperature of air at the blower outlet to <70 deg Celsius	be provided. Heat exchanger should not be provided. Water analysis is given in clause 2B.
10.	Instrumentation execution	a) All field transmitter like pressure, temperature, flow, level, DP etc. shall be foundation fieldbus or profibus type. The exact type shall be informed during technical offer evaluation. Vendor shall quote foundation fieldbus type transmitter in its base offer. Vendor to include 'price implication' if any, in its commercial offer as a separate line item against heading "Price implication (+ / -) for Profibus type transmitters". In case there is no price implication, vendor to indicate the same in the technical offer. b) Control Valve Actuators: Electrical actuators shall to be of Fieldbus type. c) The following requirements for Transmitter shall overrule relevant requirement specified in standard specifications. a. Accuracy: a) ± 0.060 % of calibrated range (minimum) for calibrated range greater than 400 mmwc. b) ± 0.065% of calibrated range (minimum) for calibrated range greater than 250 kg/cm². c) ± 0.10 % of calibrated range (minimum) for calibrated range less than 400 mmwc. b. Turn down (minimum): a) 50:1 for greater than or equal to span of 400mmwcl. b) 20:1 for span below 400mmwcl. c) 10:1 for span greater than 250 kg/cm². c. Stability: a) 0.25 % of calibrated range for 10 years for calibrated range greater than equal to 400 mmwc on standard conditions of manufacturer. b) 0.2 % of calibrated range for 1 years for calibrated range less than 400 mmwc on standard conditions of manufacturer. c) 0.15% of calibrated range for 5 years for static pressure greater than 250 kg/cm². d) Rotor Vibration Sensors: 02 nos on DE side and 02 nos on NDE side. e) Bearing Temperature Sensors: 02 nos on DE side and 02 nos on NDE side. f) SPARES LIST / Philosophy – As per Annexure V of TC62679

11	POWER SUPPLY	
	The following voltage levels shall apply:	
	3.3 kV $\pm 6\%$, 50 Hz	Voltage for motors bigger than 200 KW and for power distribution within the plant.
	415 V $\pm 10\%$, 50Hz	Standard voltage for power supplies to small electric power consumers and motors above 0.2 kW and up to 200 KW.
	Bidder shall design and supply the equipment suitable for satisfactory operation under above mentioned power supply condition.	

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6.0 MATERIAL CODES

Var No	Description	Material Code
01	Motor driven, single stage, integrally geared, Single or dual vane centrifugal type oxidation blower complete with integral gearbox, lube oil system, instrumentation and accessories. OR Positive displacement (Helical lobe) type oxidation blowers complete with VFD drive, gearbox, lube oil system, instrumentation and accessories.	TC9762679016
02	Impeller assembly/ Rotor	TC9762679024
03	Set of Bearings (Required 1No. each for complete replacement of all bearings in one Blower)	TC9762679032
04	Commissioning spares	TC9762679040
05	Blower instrumentation spare- (Spare list as per Annexure V Philosophy)	TC9762679059

7.0 PACKING INSTRUCTIONS:

1.	Please see clause 7.0 of TC52545 common specification for detailed packing instructions
2.	Each package or shipping units shall be clearly marked or stenciled on at least two sides as follows. NTPC RAMAGUNDAM STAGE-II (3X500MW), RAMAGUNDAM PEDDAPALLI DISTRICT TELANGANA, INDIA 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.
8.0	SUPERVISION OF ERECTION, TESTING AND COMMISSIONING
1.	The erection of Oxidation Blower will be done by owner as per Erection Manual and check List. However, the bidder shall make one visit per FGD system 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. There will be three visits for three FGD system. The bidder will be informed well in advance for the visit. Bidder shall include 6 working days per visit in the offer with minimum 3 visits. For 3 units 18 working days must be included. BHEL shall conduct performance test of FGD package at site. Vendor shall provide supervision services for site performance test on per diem basis for each unit.
2.	TA/DA, boarding and lodging shall be borne by the bidder and shall be inclusive in supply portion.

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9.0 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 to be used on the Blowers for review by BHEL/NTPC prior to manufacture.
2. The Bidder shall furnish MRT & Performance test procedure in line with international standard. The test procedure will be reviewed and approved by the BHEL/NTPC.
3. Out of 6 Oxidation Blower, performance test of 1 No will be witnessed by BHEL/ NTPC/ TPI before dispatch of machine at the Bidder's works or where the test facilities are available. A notice of minimum three (3) weeks shall be given for witnessing the test.
4. The Bidder shall conduct performance test for the remaining blowers and submit the reports.
5. Final inspection and release by BHEL /NTPC is a mandatory requirement unless specially waived.
6. A dynamic balancing certificate stating that the rotating assembly has been balanced dynamically shall be sent to BHEL/NTPC/TPI within one (1) week of the successful completion of balancing.
7. Acceptance tolerance of actual versus guaranteed performance for capacity, Static head, efficiency and power absorbed shall be as per applicable standard.
8. Vibration levels shall be measured during shop running/performance tests.
9. Contract shaft seals shall be used during shop tests, unless the seal design is unsuitable for the shop-test condition.
10. Blower shall not be released for shipment, until shop tests data and performance tests curves have been approved by Owner.
11. Bidder should furnish performance guarantee as per applicable standard guarantee for the design, manufacture, material and safe operation of the equipment's.
12. Bidder shall arrange all calibrated gauges, Instruments during testing.
13. Mechanical running and the performance test shall be carried out. Bidder shall arrange Motor for the shop test and inspection.
14. The performance test may be carried out using air at shop and shall be converted to the design condition.
15. Inspection and testing will be done as per NTPC approved Quality Plan. In case of order placed on foreign Vendor, Vendor shall engage and appoint at their cost of any reputed Third Party Inspection Agencies having international presence for carrying out inspection of equipment's and material at vendor's & sub vendors works. Sample QP(indicative) is attached as **Annexure-V of TC52545**.

10.0 PAINTING

1. **Surface Preparation : Blast cleaned conforming to sa2-1/2 swiss standard**
2. **PRIMER COAT:**

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	Epoxy resin based Zinc phosphate Primer with minimum DFT of 100 μm INTERMEDIATE COAT: Epoxy resin based paint pigmented with titanium dioxide with minimum DFT 100 μm FINISH COAT: One coat of epoxy paint pigmented of DFT of 75 microns. Additionally, Finish coat of polyurethane of minimum DFT of 25 microns. Final shade as per approved quality plan. The above painting is just a tentative schedule. Painting details will be informed during contract stage. a. Base: To be informed during contract stage b. Lettering: To be informed during contract stage preventive paint after inspection at shop floor before dispatch shall be in bidder's scope	
3.	Rust preventive paint after inspection at shop floor before dispatch shall be in bidder's scope	
4.	Corrosion protection, coating and galvanizing, painting shall be taken care by the bidder. Bidder shall submit the painting scheme during detail Engg in line with the specification and shall be subject to approval of BHEL / NTPC.	
11.0	SPARES,TOOLS & TACKLES	
11.1	START UP & COMMISSIONING SPARES	
	Start-up & Commissioning Spares shall be part of the main supply of Oxidation blowers. 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 Oxidation blowers 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. This start-up & commissioning spare part list shall not be included in "Initial Spare Parts List".	
11.2	INITIAL SPARE PARTS (MANDATORY SPARES):	
	Bidder to quote for below mentioned mandatory spares with break up price: a. Bearings - 1 no. of each type b. Impeller assembly – 1 no. c. Blower instrumentation spare – 1 set (As per annexure V of TC62679) Bidder shall quote for the “Initial Spares Part List”, 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 equipment's. Each item shall be labelled in English and be packed against damage and sealed to prevent deterioration from corrosion. 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.	
11.3	RECOMMENDED SPARES	
	Bidders shall also furnish the Final Spares Part List (i.e. 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.	

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11.4 SPECIAL TOOLS & TACKLES:

Any special tools & tackles required for the entire equipment to disassemble, assemble or maintain the units (**One set for each unit**), they shall be included in the quotation and furnished as part of the initial supply of the machine. 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.

12.0 PERFORMANCE GUARANTEE

All performance tests for blowers shall be carried out in accordance with any latest international codes/standards.

- 1) Bidder shall furnish Performance guarantee for the design, manufacture, material, safe and trouble-free operation of the Oxidation Blower and its accessories
- 2) Capacity and head of the blower to be guaranteed as per **Annexure-I of TC62679**.
- 3) The bidder shall guarantee 98% availability of equipment for a continues period of 120 days
- 4) The Bidder shall ensure a design of the equipment to achieve an average target availability of 90%.
- 5) Noise level- ≤ 85 dB (A) at 1m horizontal distance from equipment/enclosures and 1.5m above operating floor is to be guaranteed.
- 6) The overall vibration levels measured on the non-rotating parts of either centrifugal compressor or positive displacement compressor shall be as per ISO 10816-1 Class A/B ≤ 2.3 mm/s, however for Integrally geared type centrifugal compressor the shaft vibration shall also be measured and it shall be as per ISO7919-3. The overall shaft vibration for zone A/B shall be as per following equation
In SI units: $A = 4800/\text{SQRT}(N)$
Where,
A = amplitude of unfiltered vibration, in μm true peak to peak,
N = maximum continuous speed, in rpm.
- 7) Acceptance tests to be carried out as per the procedure defined by the bidder which shall be submitted for NTPC's approval.
- 8) 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.

13.0 BID EVALUATION CRITERIA FOR POWER CONSUMPTION:

1. POWER GUARANTEE

Bidder to specify the guaranteed Shaft power per blower operating at the Guarantee point (Operating point 3) of clause 5.0 of this specification in their offer. This power value shall be used for loading and penalty criteria.

2. BID EVALUATION CRITERIA FOR POWER CONSUMPTION:

Power consumption quoted by bidder shall be limited to the ceiling value specified below.

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	The Lowest of the power consumption quoted by any qualified bidder shall be taken as the base or ceiling value. Bid prices of other bidders will be loaded for every KW excess over the ceiling value as per the formula given below. In case, Guaranteed Shaft power offered by the bidder exceeds the ceiling value specified above, his bid price will be loaded for excess power consumption as per the formula given below. Adjustment factor for excess power consumption in INR = (GPC-CV) X PL X 6 No's of Blowers GPC- Guaranteed Power Consumption quoted by bidder in KW CV- Lowest of the power consumption quoted by any bidder PL- Power Loading @ INR 249478/KW	
14.0	LIQUIDATED DAMAGES FOR POWER CONSUMPTION	
1.	If actual Power Consumption of blower during shop PG Test measured at compressor coupling for the Guarantee point exceeds the value guaranteed by the bidder., liquidated damages for shortfall in performance shall be deducted from contract price as per the formula given below Liquidated damage deductible in INR = (GPC-APC) X P X 6 No's of Blowers - GPC- Guaranteed Power Consumption quoted by bidder in KW - APC- Actual Power Consumption in KW - P- Penalty @ INR 249478/KW Penalty for shortfall in performance as mentioned above shall be deducted from contract price, however the penalty shall be limited to 25% of contractual value. Since performance test is witnessed for the first blower, LD charges are applicable for remaining 5 No of blowers based on performance result of first blower.	
2.	Minimum Acceptance Level: 105% of Functional Guarantee Value. NTPC/BHEL reserves the right to reject the equipment if actual power consumption exceeds the minimum acceptance level.	
15.0	WARRANTY/ DEFECT LIABILITY	
1.	The warranty period shall be 24 months from the date of supply or 18 months from the date of commissioning whichever is earlier. Provided that the successful bidder shall extend the provisions of this warranty to cover all repaired and replacement parts furnished under the warranty obligations hereunder, subject to the warranty period for the same being for a period of 24 months from the date on which replacement or renewal work is completed. The Defect Liability Period shall be eighteen (18) months from the date of successful Completion of the Facilities or twelve (12) months from the date of Operational Acceptance of the Facilities. At the end of the Defects Liability Period, the contractor liability ceases except for latent defects. The contractor's liability for latent defects warranty shall be limited to a period of five (5) years from the end of Defects Liability Period. For the purpose of this clause, the latent defects shall be the defects inherently lying within the material or arising out of design deficiency which do not manifest themselves during the Defects Liability Period.	
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	

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	equipment supplied by bidder meets the guaranteed requirement.	
16.0	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. On completion of erection complete list of bearings/equipment giving their location and identification marks shall be furnished to NTPC 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.	
17.0	TRAINING	
	Successful bidder shall provide comprehensive training for NTPC Engineering, O&M, Erection & Commissioning staffs at site covering all aspects of the Oxidation blower- Operation & Maintenance, Troubleshooting etc. Cost of training is to be included in base price.	
18.0	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 BHEL 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 requirements of the Specification.	
19.0	DOCUMENTATION	
A	DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER	
	The Bidder shall submit all documents including drawings, diagrams and all such information, which are necessary to fully understand the offer for techno-commercial evaluation. As a minimum requirement, document as per Annexure-III of TC52545 shall be furnished to fully describe the scope of work and services offered. The Bidder shall also submit duly filled in Technical data sheets and guarantee schedule as per Annexure II of TC62679 and Annexure III of TC62679.	
B	DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT	
	The Successful bidder shall submit necessary data, documents, reports (including lateral analysis report) and drawings for review, approval with requirements specified as per Annexure-IV of TC52545. 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.	

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	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, ten (10) hard copies and five (05) sets 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's 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.	

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20.0	PRICE SCHEDULE				
Sl No	Description	Material Code	Quantity	Unit Price	Total Price
01	Motor driven, single stage, integrally geared, Single or dual vane centrifugal type oxidation blower complete with integral gearbox, lube oil system, instrumentation and accessories. OR Positive displacement (Helical lobe) type oxidation blowers complete with VFD drive, gearbox, lube oil system, instrumentation and accessories.	TC9762679016	6 set		
02	Impeller assembly/ Rotor	TC9762679024	1 Set		
03	1 set of Bearings (required 1 No. each for complete replacement of all bearings in one Blower)	TC9762679032	1 Set		
04	Commissioning spares- 1 set for each Blower	TC9762679040	6 Set		
05	Blower instrumentation spare -1set (Spare list as per Annexure V Philosophy)	TC9762679059	1 Set		
06	Pre-commissioning / Commissioning supervision		Per Diem		
Total price for evaluation					

Remarks:

Vendor shall provide Per Diem rate for supervision of commissioning. This is inclusive of travel, boarding and lodging. 18 no of working days at site will be considered for evaluation purpose. Refer clause no. 8.0 for details

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21. ANNEXURES

ANNEXURE –I QUALIFICATION REQUIREMENT.

The Bidders are required to meet the Qualification Requirement (QR) for Oxidation Blowers as per criteria stipulated below and necessary documents evidence requirement as per Annexure-3K.

System offered by the bidder shall be only from such manufacturer(s) who has previously designed (either by itself or under collaboration/ licensing agreement), manufactured/ got manufactured the equipment of the type, application and minimum equipment rating as stipulated below such that the equipment should have been in successful operation in at least 1 plant for a period not less than 1 year reckoned as on date 22.02.2020.

Sl. No.	Name of Equipment	Type of Equipment	Application	Equipment Rating
(c)	Oxidation Blowers	Centrifugal/ positive displacement type blower	Wet Limestone based FGD application in Coal fired power plant or any process application	Unit size of 500 MW & Above -Flow 7300 Nm ³ /hr Dry Basis (min.) with Head 8500 mmwc (min.) for spray tower process

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----

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ANNEXURE –II- TECHNICAL DATA SHEET

Sl. No	Description	Data
1.0	GENERAL	
	a. Client	: BHEL-HPEP Hyderabad
	b. Project	: NTPC RAMAGUNDAM STAGE-II (3X500 MW)
	c. Ultimate Customer	: NTPC RAMAGUNDAM
	d. Location	: Ramagundam, Peddapalli district Telangana, India
	e. Service	: Continuous
	f. Installation	: In-door
	g. No of Blowers for each unit	: 1 Working + 1 Standby
	h. Total number of Blowers	: Unit-1 - 2 No's Unit-2 - 2 No's Unit-3- 2 No's
2.0	MANUFACTURER DETAILS	
	a. Model	:
	b. Type	: Centrifugal / Positive displacement type
	c. Type of Driver	: As per specification
	d. Area classification	: Safe
	e. No of Stage	: Applicable/ Not Applicable
3.0	OPERATING CONDITION	
	a. Gas composition % by weight / Mole percent	: Atmospheric air
	b. Solids at suction g/m ³	: As per ambient condition
	c. Relative humidity at suction %	: As per ambient condition
	d. Molecular weight	: As per ambient condition
	e. Specific weight at suction Kg/m ³	: As per ambient condition
	f. Capacity at suction Nm ³ / Hr	: As per clause 5.0
	g. Suction pressure KPa	: As per clause 5.0
	h. Discharge pressure mmWc	: As per clause 5.0
	i. Differential Pressure	: Bidder to confirm
	j. Suction temperature Deg C	: Ambient
	k. Discharge temperature Deg C	: <70
4.0	PERFORMANCE DATA	
	a. Capacity Nm ³ /Hr	: #
	b. Static efficiency %	: #
	c. BKW Normal / Maximum KW	: #
	d. BKW at minimum suction temperature KW	: #
	e. Motor rating KW	: #
	f. Motor Speed rpm	: #
	g. Discharge pressure static (inclusive of losses) mmWc	: #
	h. Differential pressure (inclusive of losses) mmWc	: #
	i. Speed Maximum/ Normal/Minimum	: #
	j. Noise level	: #
	k. Performance curve	: #

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5.0 CONSTRUCTION DATA				
a.	Manufacturer	:		
b.	Model No.	:	#	
c.	Suction	:	Single	
d.	Suction Rating / Size	:	#	
e.	Discharge Rating / Size	:	#	
f.	Type of rotor	:	#	
g.	Size of rotor Dia mm	:	#	
h.	Journal bearing: Type / Size:	:	#	
i.	Thrust bearing: Type / Size:	:	#	
j.	Bearing cooling required	:	Yes / No - Bidder to confirm	
k.	Cooling water required	:	Bidder to confirm the quantity	
l.	Type of drive	:	As per specification	
m.	Shaft seal	:	Packing / Rubber seal	
n.	Size / Code	:	#	
o.	Type of coupling	:	#	
p.	Service factor	:	#	
q.	GD ² at drive shaft end	:	#	
r.	Rotation viewed from coupling end	:	Clock wise / Counter clock wise	
s.	Fluid Coupling	:	Yes / No - Bidder to confirm	
t.	Fluid Coupling make	:	#	
u.	Fluid Coupling control	:	#	
v.	Suction filter	:	Required	
w.	Degree of filtration	:	#	
x.	Base plate common to Blower. Inboard bearing housing and fluid coupling & Motor	:	Yes / No - Bidder to confirm	
y.	Total weight kg	:	#	
z.	Maximum Erection weight kg	:	#	
6.0 MATERIALS				
a.	Casing	:	#	
b.	Rotor	:	#	
c.	Shaft	:	#	
d.	Packing Seal	:	#	
e.	Suction filter elements/ housing	:	#	
f.	Base frame	:	#	

Note - Vendor to full up the columns marked with “ # “

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____

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ANNEXURE III- SCHEDULE OF GUARANTEES

Sl. No	Description	Data
1.	Rated capacity of Blower Nm ³ /hr	:
2.	Total head at design capacity mmWc	:
3.	Guaranteed power consumption at rated capacity & head kW	:
4.	Noise level at a distance of 1.0 meter from the equipment at site and 1.5 m above operating floor dB(A)	:
5.	Maximum vibration (peak to peak amplitude at site) microns	:
6.	Equipment Availability (%)	:

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----

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ANNEXURE IV- VENDOR TO PROVIDE THE LIST OF COMMISSIONING SPARES

Sl. No.	Description	Quantity
1.		
2.		
3.		
4.		
5.		

Qty will be Number or Set as applicable

- Vendor to identify each and every item which they consider as commissioning spares. Each and every part that is considered to fall under guarantee clause shall be indicated in this list.
- Rubber items which are having a **Shelf-Life** will also be considered as wear item.

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----

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ANNEXURE V- VENDOR TO PROVIDE MANDATORY INSTRUMENTATION SPARE LIST AS PER FOLLOWING SPARE INSTRUMENTATION PHILOSOPHY:

Vendor shall submit the bill of material of each item on mandatory spare, indicating the quantity used in main as well as spares.

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----

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ANNEXURE V-MAIN SPARES

SL NO	OXIDATION BLOWER INSTRUMENT SPARE ITEM DESCRIPTION / SPARE PHILOSOPHY	QTY
a	Transmitters of all types and model no. (for measurement of pressure, differential pressure, flow, level, temp, etc.). This shall include magnetic/ electromagnetic flow meter, mass flow meter also. (10% or 1 no. of each type and model, whichever is more)	
b	Temp Elements along with thermo well (except winding temp elements of motor)- 10% or 2 no. of each type, model & length, whichever is more.	
c	(i) Process Actuated Switches (Pressure, Differential pressure, flow, level, temp) (ii) Limit switches (for pneumatic and manual valves) - 10% or 2 no. of each type and model, whichever is more.	
d	Local Gauges for Pressure, Differential pressure, flow, level, temp - 5% or 1 no. of each type, model and range, whichever is more.	
e	Vibration Sensors - 10% or Minimum 2 Nos. of each type, make and model whichever is more. *if prefab cable or prefab extension cable is used same should be supplied in proportion.	
f	PROCESS CONNECTION PIPING (For Impulse Piping / Tubing and Air Supply Piping as Applicable) - Valves of all types and models - 10% or 1 no. of each type, class, size and model whichever is more. 2 way, 3way, 5way valve manifolds - 10% or 1 no. of each type, class, size and model whichever is more. - Fittings - 10% or 1 packet of each type, class, size and model whichever is more. - Filter regulators - 20% of each model or 2 nos. whichever is more.	1 set
g	CONTROL VALVES, ACTUATORS & ACCESSORIES (Following items shall be provided under this clause for all modulating control valves being supplied under this package) - Pneumatic and electro-hydraulic actuator assembly - 10% or 1 no. of each type, model and rating, whichever is more. - Valve trim (including cage, plug, stem, seat rings, guide bushings etc.) - 1 set for each type of control valve. - Diaphragms, O' rings, seals etc. of all types make etc. -100% - Pressure Gauges of all types, make, rating etc. - 10% or 2 nos. of each type whichever is more - Solenoid valves (if applicable) - 10% or 2 nos. of each type whichever is more - Positioner units (complete unit) & accessories (link assembly) - 10% or 1 no. of each type whichever is more - Pneumatic air-filter/Regulator of each type, make rating etc. - 10% or 2 Nos., whichever is more - Air lock relays - 10% or 2 nos. of each type whichever is more	

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Continue....

OXIDATION BLOWER INSTRUMENT SPARE ITEM DESCRIPTION / SPARE PHILOSOPHY	QTY
VFD TRANSFORMER (IF APPLICABLE) 1. Primary Bushings with metal parts and gaskets(if applicable) - 1 no. each rating 2. Secondary Bushings with metal parts and gaskets - 1 no. each rating 3. Winding temperature indicator with alarm & trip contacts - 1 no. 4. Oil temperature indicator with alarm & trip contacts - 1 no. 5. Magnetic oil level gauge - 1 no. 6. Pressure relief device – 1no. 7. Diaphragm for explosion vent – 1no. 8. Buchholz relay/sudden pressure relay – 1no. 9. Silica gel charge – 1no. 10. Pressure gauge (applicable for sealed tank) - 1 no. each type	1 set
VFD SYSTEM (IF APPLICABLE) 1. Electronic cards (a) Control modules - 1 nos. of each type & rating (b) I/O module - 1 nos. of each type & rating (c) Power supply modules - 1 nos. of each type & rating (d) Gate module including gate transformer - 100 % of one channel 2. Power device (Thyristor, IGBT etc.) bridge leg - 1no.(Qty. for one ph.) 3. Over voltage limiter and surge suppressor network - 1 set 4. Semiconductor fuses for Power device (thyristor, IGBT etc.) - 1 set 5. Power & Control fuse - 25% of installed quantity 6. Control Transformer - 1 nos. of each type & rating 7. Contactor/Breaker - 1 no. 8. CT/VT - 1 nos. of each type & rating 9. Indicating lamps - 100% of each type & rating 10. Auxiliary contactors & relays - 1 no. of each type & rating 11 Indicating lamp holder full set - 15% of each type and colour 13 Panel mounted meters - 1 no. of each type & rating	

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ANNEXURE –3K

Provenness Criteria/Qualification Requirement (SUB-QR) for Oxidation Blower

Project Project: NTPC RAMAGUNDAM (3X500 MW)

NTPC Clause No.

- 4.00.00 **Provenness criteria for critical equipment, auxiliaries, systems and bought out items :**
- 4.01.00 The Bidder/ Bidder's sub-vendor(s) is required to meet the provenness criteria and/ or Qualification requirement for oxidation blower as per criteria stipulated below:
- 4.01.01 Booster Fans, Slurry Recirculation Pumps, **Oxidation Blowers**, Wet Limestone Grinding Mills, Slurry Pumps, Agitators & Vacuum Belt Filters for the Wet Limestone based Flue Gas Desulphurisation (FGD) System offered by the Bidder shall be only from such manufacturer(s) who has previously designed (either by itself or under collaboration / licensing agreement), manufactured / got manufactured the respective equipment(s) of the type, application and minimum equipment rating as stipulated below such that the respective equipment(s) should have been in successful operation in at least one (1) plant for a period not less than one(1) year reckoned as on 22.02.2020.

Sl. No.	Name of Equipment	Type of Equipment	Application	Equipment Rating
(b)	Oxidation Blowers	Centrifugal/ positive displacement type blower	Wet Limestone based FGD application in Coal fired power plant or any process application	Unit size of 500 MW & Above - Flow 7300 Nm ³ /hr Dry Basis (min.) with Head 8500 mmwc (min.) for spray tower process

- 4.01.03 A JV / Subsidiary Company formed for manufacturing and supply of equipment(s) as listed at clause no. 4.01.01 above in India, shall also be considered qualified for manufacturing such equipment(s), provided that it has a valid collaboration or licensing agreement for design, engineering, manufacturing of such equipment(s) in India with a qualified equipment manufacturer who meets the requirements stipulated at clause 4.01.01 above (or the technology provider of the qualified equipment manufacturer) for the oxidation blower. Before taking up the manufacturing of such equipment(s), the bidder/ his sub-vendor(s) must create /have created manufacturing facilities at his works as per collaborator's/licenser's design, manufacturing and quality control system for such equipment(s).

Further, in such a case, such qualified equipment manufacturers should have, directly or indirectly through its holding company/ subsidiary company, at least 26% equity participation in the Indian Joint Venture Company/ Subsidiary Company, which shall be maintained for a lock-in period of seven (7) years from the date of incorporation of such Joint Venture/ Subsidiary or up to the end of defect liability period of the contract, whichever is later.

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- 4.01.04 In case the Bidder or the proposed sub-vendor is not manufacturer of proven Oxidation Blowers as per clause 4.01.01(c) above but is a manufacturer of Blowers/compressors for minimum 50 NM³/min capacity, the Bidder or the proposed sub-vendor can also manufacture Oxidation Blowers, provided it has collaboration or valid licensing agreement for design, engineering, manufacturing, supply of such Oxidation Blowers in India with such manufacturer who meet the requirements stipulated at clause 4.01.01(c) above for the Oxidation Blowers. Before taking up the manufacturing of such equipment, the bidder/ his sub-vendor must create /have created manufacturing facilities at his works as per collaborator's /licenser's design, manufacturing and quality control system for such equipments.
- 4.01.08 Before taking up the manufacturing of oxidation blower as per clause 4.01.01, 4.01.03, 4.01.04 above, the Bidder must create (or should have created) manufacturing and testing facilities at its works as per Collaborator / licensor's design, manufacturing and quality control system for such equipments duly certified by the Collaborator / licensor. Further, the Collaborator / Licensor shall provide (or should have provided) all design, design calculation, manufacturing drawings and must provide (or should have provided) technical and quality surveillance assistance and supervision during manufacturing, erection, testing, commissioning of equipments.
- 4.01.09 Bidder shall offer and supply only the type of the above equipment(s) for which he himself / Collaborator(s) / Licensor(s) proposed by the Bidder for the above equipment(s) is qualified.
- 4.01.10 The Employer (NTPC) reserves the right to fully satisfy himself regarding capability and capacity of the bidder and the proposed arrangement and may prescribe additional requirement before allowing manufacture of the equipment listed above for this contract.

Note to clause 1.2

- (1) Whenever the term 'coal fired' is appearing above, "Coal" shall be deemed to also include bituminous coal/brown coal/Anthracite Coal/lignite.

Bidder shall submit the Attachment 3K enclosed along with Supporting Documents. Also, Bidder has to submit Reference list of Plants where Oxidation Blowers have been supplied.

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**FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE
FOR
LOT-3 PROJECTS
BIDDING DOCUMENT NO. CS-0011-109(3)-9**

Bidder's Name and Address:

To
Contract Services-III
NTPC Limited
Noida-201301

Summary of Critical Equipment indicated under clause 4.01.00, sub-section-I, Part-A of Section-VI.

Equipment Name	Sub-Vendor Name	Collaborator's Name, if applicable	Seeking Qualification as per clause..... Sub-Section-I, Part-A of Section-VI
Booster Fans			*4.01.01 /*4.01.02 /*4.01.03
*Slurry Recirculation Pumps			*4.01.01 /*4.01.03 /*4.01.07
Oxidation Blowers			*4.01.01 /*4.01.03 /*4.01.04
Wet limestone Grinding mills			*4.01.01 /*4.01.03 /*4.01.05 (i)/ 4.01.05 (ii)
Slurry Pumps			*4.01.01/*4.01.03
Agitators			*4.01.01 /*4.01.03 /*4.01.06
Vacuum Belt filters			*4.01.01 /*4.01.03

Note : *Strike-off whichever is not applicable.

1. If qualification sought as per clause 4.01.01, sub-section-I-A, Part-A of Section-VI then the details of the sub vendor (manufacturer) shall be filled by the bidder in the format A to G.
2. If the qualification sought as per the clause 4.01.02, sub-section-I-A, Part-A of Section-VI, then the details of proposed sub vendor (i.e manufacturer of such equipment for at least *195/*250/*500/*660 MW unit rating) shall be filled individually by the bidder in the format A and the details of collaborator who meets the requirement stipulated at 4.01.01, sub-section-I-A, Part-A of Section-VI shall also be filled by the bidder in the format A separately. Further, in case of qualification vide clause 4.01.02, sub-section-I-A, Part-A of Section-VI a copy of valid ongoing collaboration and technology transfer agreement for design, engineering, manufacturing, supply of such equipment in India with the collaborator who meets the requirement stipulated at 4.01.01, sub-section-I-A, Part-A of Section-VI shall also be furnished.
3. If the qualification sought as per the clause 4.01.03, sub-section-I-A, Part-A of Section-VI then the details of JV/Subsidiary Company formed for manufacturing of such equipment in India shall be furnished individually for each equipment by the bidder such as,
 - i) Copy of document of incorporation of JV/Subsidiary company in India
 - ii) Copy of valid ongoing collaboration and technology transfer agreement for design, engineering, manufacturing, supply of such equipment in India with the collaborator who meets the requirement stipulated at 4.01.01, sub-section-I-A, Part-A of Section-VI.
 - iii) Copy of document of at least 26% equity participation of qualified equipment manufacturer in the Indian JV company/subsidiary company directly or indirectly through its holding company /Subsidiary company, which shall be maintained for a lock -in period of seven (7) years from the date of incorporation of such JV/subsidiary or up to the end of defect liability period of the contract which ever is later.

Further, the details of collaborator or technology provider of the qualified equipment manufacturer who meets the requirement stipulated at 4.01.01, sub-section-I-A, Part-A of Section-VI shall be filled by the Bidder in the format A to G (format given at 1.00.00). In addition to that, the sub vendor along with the Indian JV company/subsidiary company, qualified equipment manufacturer and its holding company/subsidiary company as applicable shall furnish the Letter of Support as per the format enclosed at Annexure-I.

*** strike out whichever is not applicable.**

- 1.00.00 (Applicable for Bidder/his sub vendors seeking qualification as per clause no. 4.01.01, Sub section-I, Part-A of Section-VI. Bidder shall furnish the required data only for those equipments / auxiliaries which are proposed to be sourced under this route.)

Signature of authorized signatory.....

RESTRICTED USE





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We, hereby furnish the data on proveness criteria for critical equipment, auxiliaries, systems and Bought Out Items such as Booster Fans, *Slurry Recirculation Pumps, Oxidation Blowers, Wet Limestone Grinding Mills, Slurry Pumps, & Agitators which have been designed (either by self manufacturer or under valid ongoing collaboration and technology transfer agreement), *manufactured/ *got manufactured and supplied by us /Manufacturer (or manufactured/ got manufactured & supplied by our proposed sub-vendors) and these are in successful operation in at least one (1) plant for a period not less than one year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder. The details of type and minimum equipment rating of such equipment are given below :

- C. Oxidation Blowers: We declare that, we/our Sub-Vendor, have designed (either by itself or under collaboration / licensing agreement), *manufactured/ *got manufactured and supplied at least one (1) number of Oxidation Blower of required flow & head of the offered Blower, Centrifugal/positive displacement type working in FGD application in Coal fired power plant or any other process application and which has been in successful operation for minimum one (1) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder, as per the details furnished below:

Sl. No.	Description	Reference Work
1.	Name of the reference plant & location:	
2.	Client name and his address: Oxidation	
3.	No. of units and capacity in MW of unit:	
4.	Whether power plant is coal fired	-*Yes/*No
5.	Whether operating in a Wet Limestone based FGD application in Coal fired power plant	-*Yes/*No
6.	Name of equipment manufacturer & address:	
7.	Date of commission of the equipments:	
8.	Model no. of the equipment:	
9.	Brief Technical particulars of the equipments:	
10.	Flow-	Nm ³ /h
11.	Head-	 mmWC
12.	Whether the equipment(s) are in successful operation in atleast one (01) plant for a period not less than one (01) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder	-*Yes/*No
13.	Flue gas Desulphurization system details:	*Technical extract/ *paper letter/ *email/ *Drawing from user or *contract document or *scheme or *any document in public domain enclosed at annexure.....to Attachment-3K
14.	Scope of Work:	*Letter of Award or *Contract or *P.O. enclosed at Annexure.....to Attachment-3K
15.	Performance details:	*Certificate/*Letter/*E-mail from End user enclosed at Annexure.....to Attachment-3K

* Strike off whichever is not applicable.

Signature of authorized signatory.....

RESTRICTED USE





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*3.00.00 Applicable for JV Company/Subsidiary Company meeting provenness criteria as per clause no. 4.01.01, Sub section-IA, Part-A of Section-VI.

3.01.00 We, hereby confirm that JV company/ Subsidiary company (Strike off whichever is not applicable) formed for manufacturing and supply of equipment(s) (*Booster Fans, *Slurry Recirculation Pumps, *Oxidation Blowers, *Wet Limestone Grinding Mills, *Slurry Pumps, *Agitators, *Vacuum Belt Filters) has a valid ongoing collaboration and technology transfer agreement for design, engineering, manufacturing of such equipment(s) in India with a qualified equipment manufacturer who meets the requirements stipulated at clause 4.01.01 of sub-section-I, Part-A, Section VI of bidding documents (or the technology provider of the qualified equipment manufacturer). Further, in such a case, such qualified equipment manufacturers is having, directly or indirectly through its holding company/subsidiary company, at least 26% equity participation in the Indian Joint Venture Company/subsidiary company, which shall be maintained for a lock-in period of seven (7) years from the date of incorporation of such Joint Venture / Subsidiary or up to the end of defect liability period of the contract, whichever is later. Before taking up the manufacturing of such equipment(s) (*Booster Fans, *Slurry Recirculation Pumps, *Oxidation Blowers, *Wet Limestone Grinding Mills, *Slurry Pumps, *Agitators, *Vacuum Belt Filters), we/ our sub vendor(s) *will create / *have created manufacturing facilities at his works as per collaborator's/licenser's design, manufacturing and quality control system.

We further confirm that details in respect of collaboration / valid licencing agreement for the aforesaid equipment(s) (*Booster Fans, *Slurry Recirculation Pumps, *Oxidation Blowers, *Wet Limestone Grinding Mills, *Slurry Pumps, *Agitators, *Vacuum Belt Filters) who meets the requirement stipulated at clause 4.01.01, sub-section-I, Part-A, Section-VI for are enclosed at Annexure-..... to this Attachment.

Signature of authorized signatory.....

*4.00.00 Applicable for Bidder/his sub vendors seeking provenness criteria as per clause no. 4.01.04, Sub section-I, Part-A of Section-VI.

4.01.00 We, hereby confirm that *we/*our sub-vendors is a manufacturer of Blowers/compressors for minimum 50 NM³/min capacity. (Details of references enclosed at Annexure)

(Data to be furnished in line with format given at 1.00.00 of this Attachment))

4.02.00 We further confirm that details in respect of collaboration / valid licencing agreement for the Oxidation Blower between *us/*our sub-vendors, as per 4.01.00 above, and with qualified Oxidation Blower manufacturer, who meets the requirement stipulated at clause 4.01.01, sub-section-I, Part-A, Section-VI are enclosed as per Annexure-I to this Attachment. The data in respect of provenness criteria for the qualified Oxidation Blower manufacturer, which are in successful operation in at least one (1) plant for a period not less than one reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder are furnished below. We further confirm that we/ our sub vendor(s) have created manufacturing and testing facilities at our/ their works as per collaborator's/ Licensor's design, manufacturing & quality control system for the Oxidation Blowers.

We further confirm that before taking up the manufacturing of such Oxidation Blower *we/ *our sub vendor(s) *will create / *have created manufacturing facilities at his works as per collaborator's/licenser's design, manufacturing and quality control system.

We further confirm that details in respect of collaboration / valid licencing agreement for the Oxidation Blowers who meets the requirement stipulated at clause 4.01.01, sub-section-I, Part-A, Section-VI for are enclosed at Annexure-..... to this Attachment.

(Data to be furnished in line with format given at 1.00.00 of this Attachment)

Signature of authorized signatory.....

RESTRICTED USE



	PRODUCT STANDARD TURBINES & COMPRESSORS HYDERABAD	TC-6-2679
		Rev.No. 00
		SHT 28 OF 29

ANNEXURE-I

(On Company's Letter Head)
LETTER OF SUPPORT FOR SATISFACTORY PERFORMANCE
of..... (Name of Equipment / System*)
for (Name of the Project) of Lot-3 Projects
for Flue Gas Desulphurisation (FGD) System Package

TO,
[EMPLOYER'S NAME & ADDRESS]

Sub: Letter of Technical Support submitted From (name of the Associate*/ Collaborator*/ Technology provider* / Licensor*)
undertaking the responsibility for satisfactory performance of(name of equipment/system*).

Dear Sirs,

1. In accordance with the Award of the Contract by (Name of the Contractor) to M/s. (Name of the sub-vendor), we, the aforesaid Associate*/Collaborator*/Technology provider*/Licensor*, (M/s) shall be fully responsible for the satisfactory performance of the(name of equipment/system*).
2. Further, the manner of achieving the objective set forth in point 1 above shall be as follows for (name of equipment/system*):
 - (a) We shall provide design, manufacturing and assembly drawings of..... (name of equipment/system*). (name of equipment/system*) shall be manufactured and supplied as per above design provided by us and the drawings approved by Employer.
 - (b) We shall depute technical experts to Bidder's/sub-vendor's works for supervision during manufacturing, assembly, erection, commissioning and final testing (as and when necessary) of the..... (name of equipment/system*).
 - (c) We shall promptly carry out all the corrective measures and shall promptly provide corrected design and shall undertake replacements, rectifications or modifications to the equipment/system* as and when required by Employer in case the equipment/system* fails to demonstrate successful performance as per contract at site.
3. We, the Associate*/Collaborator*/Technology provider*/Licensor* do hereby undertake and confirm that this Letter of Technical Support shall be valid until the end of defect liability period of the contract.

Signature of the Authorised Representative...

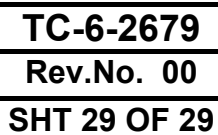
For M/s
(Associate*/Collaborator*/Technology provider*/Licensor*)
Name
Designation
Date.....
Common Seal of the Company

*: Strike off whichever is not applicable.

Signature of authorized signatory.....

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ESTRATEGIA