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Rev. : 01

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PROJECT : DADRI 2x490MW – FGD PACKAGE

CUSTOMER : NTPC

**PURCHASE SPECIFICATION
FOR
PITOT TUBE TRANSMITTER
&
INDICATOR**

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SECTION- A

GENERAL INSTRUCTIONS TO BIDDERS:

All required documents against this Tender/Specification shall be submitted in English only.

Introduction: Bidders are required to offer Pitot tube transmitter & indicator to be used in FGD based Power Plant applications.

In order to accept the Technical offers / proposals from Bidders for the project mentioned in this Specification (refer Sections C & D), certain Pre-qualification criteria are required to be met by Bidder.

Pre-qualification requirements are clearly mentioned in Section-B of this Specification. Bidder to read the same carefully and submit the details required for BHEL's acceptance.

In case Bidder does not include the details or meet the requirements of Pre-qualification requirements, their offer will be summarily rejected and Bidder's Technical offers will not be evaluated.

Evaluation methodology: BHEL shall initially open Bidder's PQR documents only as per Section-B of this specification for review & acceptance. Only after acceptance of PQR documents, BHEL shall open Bidder's technical offers for evaluation. Commercial bids of only accepted/ approved Bidders by End users/ Customers, shall be considered by BHEL for further processing.

Bidders are required to submit offers as detailed below:

- A. Documents pertaining to Pre-Qualification requirements for Section-B along with point-wise compliance to be uploaded as Part-I Bid.
- B. Technical offers/ proposals for the Project, whose requirements are mentioned in Sections C & D to be submitted along with point-wise compliance and uploaded as Part-II Bid.

Note 1:-Whenever required during evaluation of PQR and Technical offers/bids, vendor is required to be present at BHEL Electronic Division, Bangalore, for discussions. Further in the event of order, during approval of the Vendor documents by End users/Customers, Vendor shall accompany BHEL representative for discussions.

Note 2:- Deviations (if any) shall be discussed with only those vendors who quote for this tender.

SECTION- B

Pre-Qualification Requirements (PQR) of Bidders for Pitot tube transmitter & indicator:

1. The bidder should have executed/ completed work of “ Design, supply, erection & commissioning of Pitot tube transmitter & indicator and the same shall be successfully commissioned and working satisfactorily for at least one year in one station of power plant of unit rating 200MW or above as on the date of bid opening of this tender. Bidder means either OEM of instrument or authorized representatives/ system integrators of instrument OEM. Bidder shall submit End-User Certificates to meet the above requirement for the offered instruments.
2. Original Equipment Manufacturers (OEM) based outside India, who are making offer for this tender shall have authorized representatives in India for support related to Documentation, Erection, Commissioning & any other co-ordination work. This Authorization provided by OEM to representatives shall indicate the Type, Duration & Validity of the agreement. The Indian representatives should have the team of experienced service engineers on payroll located at various parts of INDIA. Submit documents like Organization chart, list of offices & manufacturing facilities, list of service engineers, etc. for the Authorized Indian representative/ system integrators.
3. Submit Reference List of Projects wherein offered system is supplied & commissioned with details like Customer Name, supply & commissioning date as available on date.
4. For Vendors offering upgraded / latest models, PQR of equivalent previous models is acceptable subject to meeting PQR indicated in clause No. 1 of Section-B. OEM shall certify that offered model is upgraded version of previous model.
5. Instrument OEM shall furnish a undertaking that in case of change in Indian representative/ agent, Instrument OEM shall continue to support supplies w.r.t to field service and supply of spare parts.
6. Technical literature / Manuals of offered Sensors/ System/ Accessories. In the event of technical specification not indicated in Technical literature, confirmation from Instrument OEM is acceptable. Such confirmations shall be suitably supported by certificates like Type test/ Routine test certificates



Important Note: In case Bidder does not submit details/ compliance to the clauses mentioned above or meet the Pre-qualification requirements, Offers will be summarily treated as incomplete & rejected and Bidder's Technical offers/proposals will not be evaluated. Please read carefully the GENERAL INSTRUCTIONS in Section A of this specifications.

Note 3: A point-wise compliance for SECTION-B along with all relevant documents and credentials as per Note 4 & signed & stamped Sub Supplier Questionnaire are mandatory.

Note 4: Bidder to submit all required credentials like End User Certificates, Site commissioning MOM's, Reference list for supplies made, Catalogues, Unpriced Purchase Orders, Company profile of Instrument OEM & authorized representative/ system integrator etc. for the offered Pitot tube transmitter & indicator & Sub-Supplier Questionnaire, the same will be submitted to customer by BHEL and await customer's decision for a maximum of one month from the date of PQ bid opening. If approval is not received within the above period, BHEL shall treat the offer as "NOT Meeting PQ" criteria and offer shall be rejected.



CORPORATE QUALITY ASSURANCE
SUB-VENDOR QUESTIONNAIRE

i.	Item/Scope of Sub-contracting	
ii.	Address of the registered office	Details of Contact Person (Name, Designation, Mobile, Email)
iii.	Name and Address of the proposed Sub-vendor's works where item is being manufactured	Details of Contact Person: (Name, Designation, Mobile, Email)
iv.	Annual Production Capacity for proposed item/scope of sub-contracting	
v.	Annual production for last 3 years for proposed item/scope of sub-contracting	
vi.	Details of proposed works	
1.	Year of establishment of present works	
2.	Year of commencement of manufacturing at above works	
3.	Details of change in Works address in past (if any)	
4.	Total Area	
	Covered Area	
5.	Factory Registration Certificate	Details attached at Annexure – F2.1
6.	Design/ Research & development set-up (No. of manpower, their qualification, machines & tools employed etc.)	Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design Details attached at Annexure – F2.2 (if applicable)
7.	Overall organization Chart with Manpower Details (Design/Manufacturing/Quality etc)	Details attached at Annexure – F2.3
8.	After sales service set up in India, in case of foreign sub-vendor (Location, Contact Person, Contact details etc.)	Applicable / Not applicable Details attached at Annexure – F2.4
9.	Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any	Details attached at Annexure – F2.5



CORPORATE QUALITY ASSURANCE
SUB-VENDOR QUESTIONNAIRE

10.	Quality Control exercised during receipt of raw material/BOI, in-process , Final Testing, packing			Details attached at Annexure – F2.6		
11.	Manufacturing facilities (List of machines, special process facilities, material handling etc.)			Details attached at Annexure – F2.7		
12.	Testing facilities (List of testing equipment)			Details attached at Annexure – F2.8		
13.	If manufacturing process involves fabrication then-			Applicable / Not applicable		
	List of qualified Welders			Details attached at Annexure – F2.9		
	List of qualified NDT personnel with area of specialization			(if applicable)		
14.	List of out-sourced manufacturing processes with Sub-Vendors' names & addresses			Applicable / Not applicable Details attached at Annexure. –F2.10 (if applicable)		
15.	Supply reference list including recent supplies			Details attached at Annexure – F2.11 (as per format given below)		
<i>Project/ package</i>	<i>Customer Name</i>	<i>Supplied Item (Type/Rating/Model /Capacity/Size etc)</i>	<i>PO ref no/date</i>	<i>Supplied Quantity</i>	<i>Date of Supply</i>	
16.	Product satisfactory performance feedback letter/certificates/End User Feedback			Attached at annexure - F2.12		
17.	Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product (similar or higher rating) Note:- Reports need not to be submitted			Applicable / Not applicable Details attached at Annexure – F2.13 (if applicable)		
18.	Statutory / mandatory certification for the proposed product			Applicable / Not applicable Details attached at Annexure – F2.14 (if applicable)		
19.	Copy of ISO 9001 certificate (if available)			Attached at Annexure – F2.15		
20.	Product technical catalogues for proposed item (if available)			Details attached at Annexure – F2.16		
Name: _____						
Desig: _____		Sign: _____		Date: _____		

Company's Seal/Stamp:-



SECTION- C

SUPPLY REQUIREMENTS OF PITOT TUBE TRANSMITTER & INDICATOR:

PROJECT REQUIREMENT:

NAME OF OWNER / END USER: NTPC

PROJECT: DADRI 2x490MW FGD PACKAGE – AS PER BOM

SCOPE:

1. Pitot Tube Transmitter & Indicator as per Specification CE /416/DADRI/PT/PS. Quantity as above for the project. Unit rates to be provided for all major items in the offer.
2. Following separate documents to be furnished in the event of order:
 - 3.1 Drawings, Data Sheets, Technical Literature – 1 sets.
 - 3.2 Test Certificates/ Reports and Calibration Reports, for approval, before dispatch of items.
 - 3.3 O & M Manuals – 2 Sets (1 Sets to BHEL-EDN & 1 Sets to Site with Consignment).
3. Erection and Commissioning for offered system
 - Erection Supervision, Total Commissioning and Handing over of the offered system to Owner / End user
4. Specific Requirement: Vendors to quote / confirm the following project specific requirements:
 - a. Vendors to confirm project specific technical requirement as per CE/416/DADRI/PT/PS SECTION-B, any deviation w.r.to the specification to be clearly indicated in the offer.
 - b. Bidder to contact BHEL for any Pre-Bid queries well in advance before submitting the offer.

SECTION- D

01. TECHNICAL SPECIFICATION FOR PITOT TUBE TRANSMITTER:

General Specifications:-

1. Principle of measurement : Differential Pressure
2. Flue gas Temperature : As Per BOM
3. Ambient temperature : 50 ° C
4. Mounting : In Duct/ Pipe
5. Display : LED/LCD
6. Measurement range : As Per BOM fully selectable
7. Zero & span adjustment: to be provided with range selection.
8. Type of Electronics: Microprocessor based with self-diagnostic.
9. Power Supply : 240V, 50 Hz, 1 Phase
10. Accuracy : As per OEM Design suitable for Service details as per BOM
11. Response time : As per OEM Design suitable for Service details as per BOM
12. Zero & Span drift : As per OEM Design suitable for Service details as per BOM
13. Calibration: Zero Check Facility.
14. Digital Signal Transmission: RS485 port Modbus protocol/ Ethernet TCP/IP protocol.
15. Analog output: 4-20mA DC galvanically isolated.
16. Alarm output: (2NO + 2NC) 2 SPDT potential free contacts rated at 5 A 230 VAC/0.5 V A 220 VDC. Alarm set points programmable through keyboard.
17. Input normalization : Dynamic [With pressure and temperature sensor] and also provision for key pad entry of inputs
18. Probe material: Stainless Steel 316 Ti Coated.
19. Enclosure: Die cast aluminum/SS housing rated to IP-55 for control unit.
20. Automatic Purging system to be provided, Compressed air if required for Purging shall be provided by BHEL. Alarm indication for faults in purging system to be provided.



02. TECHNICAL SPECIFICATION FOR PITOT TUBE INDICATOR:

General Specifications:-

1. Principle of measurement : Differential Pressure
2. Flue gas Temperature : As Per BOM
3. Ambient temperature : 50 ° C
4. Mounting : In Duct/ Pipe
5. Display : LED/LCD
6. Measurement range : As Per BOM fully selectable

7. Zero & span adjustment: to be provided with range selection.
8. Type of Electronics: Microprocessor based with self-diagnostic.
9. Power Supply : 240V, 50 Hz, 1 Phase
10. Accuracy : As per OEM Design suitable for Service details as per BOM
11. Response time : As per OEM Design for Service details as per BOM
12. Zero & Span drift : As per OEM Design suitable for Service details as per BOM
13. Calibration: Zero Check Facility.
14. Input normalization : Dynamic [With pressure and temperature sensor] and also provision for key pad entry of inputs
15. Probe material: Stainless Steel 316 Ti Coated.
16. Enclosure: Die cast aluminum/SS housing rated to IP-55 for control unit.
17. Automatic Purging system to be provided, Compressed air if required for Purging shall be provided by BHEL. Alarm indication for faults in purging system to be provided.

Bidder shall furnish Clause-wise compliance / deviation list along with the offer, which is mandatory for evaluating the offer. The deviations to be clearly mentioned in the offer and acceptance of these deviations will be subject to customer approval. If Bidder incurs any additional cost for the withdrawal of any deviation, the same shall be borne by the bidder without any cost implication to BHEL.

Bidder to provide mating & counter flanges with gaskets & bolts as per attached BOM for all applicable tag Nos.



SECTION- E

A. PRICING SHEET FOR PITOT TUBE TRANSMITTER & INDICATOR:

SL. NO.	DESCRIPTION	QTY FOR DADRI	UNIT	UNIT PRICE (RS.)	TOTAL PRICE (RS.)
1	Pitot Tube Transmitter	04	NOS.		
2	Accessories for Pitot Tube Transmitter	04	Set		
3	Pitot Tube Indicator	04	NOS.		
4	Accessories for Pitot Tube Indicator	04	Set		

Flow Indicator														
S.NO	TAG NO	DESCRIPTION	Inst	MEDIUM	Operating Pressure (KPa)	Normal Temperature	Maximum Pressure (kPa)	Maximum Temperature	Flow	Line Size	Range	Process connection	Straight Length available Upstream distance	straight duct length available Downstream distance
1	10HTA01CF002	Unit-1 Untreated Flue gas Flow Indicator (Absorber Inlet)	FI	Flue gas	2.3	150 Deg C	6.47	300 Deg C	3535200 m3\hr	Duct Size - 5.5 m X 12 m	0-4000000 m3/hr	2" ANSI 150 FF	8.6 m	8.6 m
2	10HTA01CF003	Unit-1 Treated Flue gas Flow Indicator (Absorber Outlet)	FI	Flue gas	0.5	61.3 Deg C	6.47	68 Deg C	2913216 m3\hr	Duct Size - 5.3 m X 10.2 m	0-3500000 m3/hr	2" ANSI 150 FF	5 m	5 m
3	20HTA01CF002	Unit-2 Untreated Flue gas Flow Indicator (Absorber Inlet)	FI	Flue gas	2.3	150 Deg C	6.47	300 Deg C	3535200 m3\hr	Duct Size - 5.5 m X 12 m	0-4000000 m3/hr	2" ANSI 150 FF	8.6 m	8.6 m
4	20HTA01CF003	Unit-2 Treated Flue gas Flow Indicator (Absorber Outlet)	FI	Flue gas	0.5	61.3 Deg C	6.47	68 Deg C	2913216 m3\hr	Duct Size - 5.3 m X 10.2 m	0-3500000 m3/hr	2" ANSI 150 FF	35 m	35 m

FLOW TRANSMITTER														
S.NO	TAG NO	DESCRIPTION	Inst	MEDIUM	Operating Pressure (KPa)	Normal Temperature	Maximum Pressure	Maximum Temperature	Flow	Line Size	Range	Process connection	Straight Length available Upstream distance	straight duct length available Downstream distance
1	10HTA01CF001	Unit-1 Untreated Flue gas Flow Transmitter (Absorber Inlet)	FT	Flue Gas	2.3	150 Deg C	6.47	300 Deg C	3535200 m3/hr	Duct Size - 5.5 m X 12 m	0-1400 m3/s	4"ANSI 150 FF	8.6 m	8.6 m
2	10HTA01CF004	Unit-1 Treated Flue gas Flow Transmitter (Absorber Outlet)	FT	Flue Gas	0.5	61.3 Deg C	6.47	68 Deg C	2916000 m3/s	Duct Size - 5.3 m X 10.2 m	0-1400 m3/s	4"ANSI 150 FF	5 m	5 m
3	20HTA01CF001	Unit-2 Untreated Flue gas Flow Transmitter (Absorber Inlet)	FT	Flue Gas	2.3	150 Deg C	6.47	300 Deg C	3535200 m3/hr	Duct Size - 5.5 m X 12 m	0-1400 m3/s	4"ANSI 150 FF	8.6 m	8.6 m
4	20HTA01CF004	Unit-2 Treated Flue gas Flow Transmitter (Absorber Outlet)	FT	Flue Gas	0.5	61.3 Deg C	6.47	68 Deg C	2916000 m3/hr	Duct Size - 5.3 m X 10.2 m	0-1400 m3/s	4"ANSI 150 FF	35 m	35 m

Note:- If Bidders are offering Process connection bigger than indicated sizes, matching expanders/flanges shall have to be offered by bidder.

FGD DADRI 2x490MW FLUE GAS PARAMETERS

STREAM No.	<u>FGD INLET</u>		<u>FGD OUTLET</u>	
	A	B	C	I
Flow gas flow m3N/h (W)	22, 17, 600	22, 17, 600	23, 79, 548	6, 410
FLOW RATE m3N/h (D)	18, 83, 297	18, 83, 297	18, 88, 555	6, 043
H2O VOL%	15.08	15.08	20.63	5.73
SO2 ppm (D)	806	806	40	0
SO3 ppm (D)	4	4	4	0
NH3 ppm (D)	0	0	0	0
CO2 VOL%	10.14	10.14	9.51	0.00
O2 VOL%	6.06	6.06	5.67	19.70
N2 VOL%	68.65	68.65	64.18	74.57
(NH4) 2SO4 ppm (D)	0	0	0	0
HCL ppm (D)	53	53	0	0
HF ppm (D)	14	14	0	0
DUST mg/m3N (D)	235.5	235.5	117.4	0.0
TEMP. degC	150.0	150.0	61.3	100.0
HeatContent Mcal/h	2, 70, 103.626	2, 70, 103.626	2, 81, 346.083	377.321
Sp. Heat Kcal/Nm3. degC	0.33689	0.33689	0.33149	0.31730
Density kg/m3	0.81836	0.81836	1.01009	0.92232
Humidity H2O/DRY	0.10578	0.10578	0.15504	0.03799