BoQ : Flow Element Orifice

Item Number	Item Title	Item Description	Item Quantity	Unit of Measure	Consignee ID	Delivery Period (In number of days)
1	145-43079-A	OPA-SCS DISCHARGE HEADER	1	NOS	SUDHIR_MOUDA_PEM	999
2	145-43179-A	ECW SUPPLY HDR FLOW	1	NOS	SUDHIR_MOUDA_PEM	999
3	145-43181-A	ECW(FGD) RETURN HEADER	1	NOS	SUDHIR_MOUDA_PEM	999
4	145-43090-A	STSRT UP COMMISSIONING SPARES	1	LOT	SUDHIR_MOUDA_PEM	999
5	145-43089-A	CALIBRATION CHARGES	1	SET	SUDHIR_MOUDA_PEM	999

TECHNICAL SPECIFICATION

FOR

FLOW ELEMENT ORIFICE

(ALONG WITH ACCESSORIES)

2 X 500 MW NTPC MAUDA STAGE-I

FGD SYSTEM PACKAGE

VOLUME - IIB

SECTIONS-A, C & D

SPECIFICATION No: PE-TS-444-145-I105

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT DIVISION
NOIDA, INDIA

BHEL	**TECHNICAL SPECIFICATION FOR FLOW ELEMENT ORIFICE (Along with Acessories) 2 X 500 MW NTPC MAUDA STAGE-I FGD SYSTEM PACKAGE**	SPEC NO.: **PE-TS-444-145-I105** VOLUME II B SECTION A REV. NO. 00 DATE 1.12.2022 SHEET

SECTION – A

SCOPE OF ENQUIRY

	TECHNICAL SPECIFICATION FOR FLOW ELEMENT-ORIFICE (Along with Accessories) 2 X 500 MW NTPC MAUDA STAGE-I FGD SYSTEM PACKAGE	SPEC NO.: **PE-TS-444-145-I105**	
		VOLUME II B	
		SECTION A	
		REV. NO. 00	DATE 1.12.2022
		SHEET	

SCOPE OF ENQUIRY

1.0 SCOPE

1.1 This specification covers the Design, Manufacture, calibration, Inspection and Testing at manufacturer's works, proper packing for transportation and delivery to site of the Flow Element Orifice as mentioned in different sections of this specification for 2X500 MW MAUDA STAGE-I FGD system package.

1.2 The quality plan enclosed, forms the minimum requirement but not limited to be adhered to by the bidder. Bidder to sign and stamp the same and submit along with the offer as an acceptance.

1.3 Scope of supply shall be Flow Element Orifice Assembly along with Accessories as indicated in Specification

1.4 Following formats to be signed, stamped with company seal and submitted:

a) Complete offer including calculation sheets, catalogues, etc.
b) Quality Plan
c) Datasheets A & B, duly filled

2.0 GENERAL TECHNICAL INSTRUCTIONS

2.1 It is not the intent here to specify all the details of design and manufacture. However, the equipment shall conform in all respects to high standard of design, engineering and workmanship and shall be capable of performing the required duties in a manner acceptable to the customer / consultant, who will interpret the meaning of drawing and specification and shall be entitled to reject any component or material which in his judgment is not in full accordance herewith.

2.2 The omission of specific reference to any component / accessory necessary for the proper performance of the equipment shall not relieve the supplier of the responsibility of providing such facilities to complete the supply within the quoted prices.

2.3 BHEL's/Customer's representative shall be given access to the shop in which the equipment is being manufactured or tested and all test records shall be made available to him.

2.4 The equipment covered under this specification shall not be dispatched unless the same have been finally inspected, accepted and Material Dispatch Clearance Certificate (MDCC) is issued by BHEL.

	TECHNICAL SPECIFICATION FOR FLOW ELEMENT ORIFICE (Along with Accessories) 2 X 500 MW NTPC MAUDA STAGE-I FGD SYSTEM PACKAGE	SPEC NO.: **PE-TS-444-145-I105**
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SECTION-C

- **SPECIFIC TECHNICAL REQUIREMENT**
- **CUSTOMER'S SPECIFICATION**

	Technical specification for **Flow Element Orifice (Along with Accessories)**	SPEC NO.: PE-TS-444-145-I105	
		VOLUME II-B	
		SECTION C	
		REV. NO. 00	DATE: 01.12.2022

SPECIFIC TECHNICAL REQUIREMENTS

1.0 This specification covers the Design, Manufacture, Calibration (at approved labs), Inspection and testing at manufacturer's works, proper packing for transportation and delivery to site of the complete Orifice Plate assembly, Start-up/Commissioning Spares as mentioned in different sections of this specification.

2.0 GENERAL INSTRUCTIONS

I. It is not the intent here to specify all the details of design and manufacture. However, the equipment shall conform in all respects to high standard of design, engineering and workmanship and shall be capable of performing the required duties in a manner acceptable to the customer / consultant, who will interpret the meaning of drawing and specification and shall be entitled to reject any component or material which in his judgment is not in full accordance herewith.

II. The omission of specific reference to any component / accessory necessary for the proper performance of the equipment's shall not relieve the supplier of the responsibility of providing such facilities to complete the supply within the quoted prices.

III. BHEL's / Customer representatives shall be given access to the shop in which the equipment's are being manufactured or tested and all test records shall be made available to them.

IV. The Equipment covered under this specification shall not be dispatched unless the same have been finally inspected, accepted and Material Dispatch Clearance Certificate (MDCC) is issued by BHEL / Customer.

V. Quality plan to be duly signed and stamped and to be furnished along with the bid as a token of acceptance. **Any deviation w.r.t Quality Plan shall not be acceptable and bid / offer shall be rejected.**

VI. In case of any discrepancy in the requirement within the same or different section, as noted by the bidder in the specification, the same will be brought to the notice of BHEL in the form of pre- bid clarification. In absence of any pre-bid clarification, the more stringent requirement as per interpretation of BHEL/customer shall prevail without any commercial implication.

VII. Scope of supply shall include flow element orifice assembly including flange with nut & bolt, stub, nipples, plug, pair of gasket, spares etc. as indicated in the specification.

3.0 For vertical installation of Orifices (if any), the S-bent impulse pipe shall be supplied by bidder without any commercial implication. The same shall be informed by BHEL during project specific order.

	Technical specification for **Flow Element Orifice (Along with Accessories)**	SPEC NO.: PE-TS-444-145-I105	
		VOLUME II-B	
		SECTION C	
		REV. NO. 00	DATE: 01.12.2022

4.0 Inspection will be conducted by BHEL, end customer and/or their authorized representatives as per the agreed inspection schedule. The inspection schedule will be submitted by the bidder for BHEL's approval at contract stage. The cost of all tests and inspections will be deemed to have been included in the contract. For all the type tests "Type Test Certificates" shall be furnished. In the absence of the same, such Tests shall be conducted at the Vendor's works in the presence of BHEL, end customer and/or their authorized representatives or in independent Test House/ Laboratory approved by BHEL.

9.00.00 **SPECIFICATION FOR FLOW ELEMENTS**

9.01.00 **Orifice Plate**

Features	Essential/Minimum Requirements
Type	Concentric as per ASME PTC-19.5 (Part-II), ISA RP-3.2, 1960 or BS-1042, ISO 5167
Material	316 SS
Thickness	3 mm for main pipe diameter up to 300 mm and6 mm for main pipe dia above300 mm.
Material of branch pipe	Same as main pipe
Root valve type	Globe
Root valve material	Same as pipe material
Root valve size	1 / 2 inch or 1 inch (as applicable)
Impulse pipe of same material up to root valve	Required
Tappings	Flanged weld neck or D & D/2 with 3 pairs of tapping (as applicable).
Beta Ratio	0.34 to 0.7
Beta Ratio calculation to be submitted	Yes
Assembly drg. and flow Vs DP Curves	Yes
Accessories	flanges, Vent/drain hole(As required)

CLAUSE NO.	TECHNICAL REQUIREMENTS
	Contractor shall submit certified flow calculation and differential pressure vs. flow curves for each element for Employer's approval. Sizing calculation, precise flow calculation for all the flow elements, fabrication and assembly drawings and installation drawings shall be submitted for Employer's approval.

	Technical specification for **Control Valves with Accessories** (Pneumatically Operated)	SPEC NO.: **PE-TS-444-145-I105**
		DOCUMENT NO.
		VOLUME II B
		SECTION C
		REV. NO. 00 / DATE 01.12.2022

We shall comply with the following: -

1. All the requirements as stated in Technical Specification / Specific Technical requirement / Data sheets / quality plan etc as enclosed in the tender, shall be fully complied without any deviation.

2. BHEL Quality Plan (enclosed with the specification) duly signed and stamped is submitted herewith without any deviation.

3. Sizing Calculations, Data sheet-C in line with Data sheet-A of specification, dimensional drawings / edge preparation details, etc shall be submitted for BHEL/Customer review and approval, to reach BHEL within 15 days after receipt of LOI.

4. Any change in Sizing calculations, QP etc., if desired by BHEL / Customer during approval of the documents after award of contract, without major changes in process parameters as per tender Specification, shall be carried out without any commercial implication and time delay.

5. The offered Flanges, Nipples, Reducers are suitable for the applicable process parameters.

(To be Signed & Stamped by the Bidder)

Signature with date	
Name	
Company seal	

	TECHNICAL SPECIFICATION FOR FLOW ELEMENT ORIFICE (Along with Accessories) 2 X 500 MW NTPC MAUDA STAGE-I FGD SYSTEM PACKAGE	SPEC NO.: PE-TS-444-145-I105 VOLUME II B SECTION D REV. NO. 00 DATE : 1.12.2022 SHEET

SECTION-D

- **EQUIPMENT SPECIFICATION**
- **DATA SHEETS – A & B**
- **QUALITY PLAN**
- **BOQ-MAIN SUPPLY**
- **SPARES**

	TECHNICAL SPECIFICATION FOR FLOW ELEMENT ORIFICE (Along with Accessories) 2 X 500 MW NTPC MAUDA STAGE-I FGD SYSTEM PACKAGE	SPEC NO.: PE-TS-444-145-I105	
		VOLUME II B	
		SECTION D	
		REV. NO. 00	DATE : 1.12.2022
		SHEET	

1.0 SCOPE

This specification covers the design, manufacture, calibration, inspection and testing at the manufacturer's works, proper packing for transportation and delivery to site of flow measuring devices (orifices) for use in Utility/Captive Power Station/Combined Cycle Station.

2.0 CODES AND STANDARDS

2.1 All the equipment specified herein shall comply with the requirements of the latest issue of the relevant National and International standards.

2.2 The Design and Materials used for the components shall also comply with the relevant National and International standards.

2.3 As a minimum requirement, ISO 5167 / BS 1042 standard shall be complied with for Flow Orifices.

3.0 TECHNICAL REQUIREMENTS

The orifice plates shall be used as the primary flow sensing elements. These sensing elements shall provide a safe and reliable means of creating differential pressure for use in flow measurement.

3.1 Orifice Plates

The orifice plate assemblies shall conform to the following requirements unless specified otherwise in the corresponding data sheets.

3.1.1 Type:
The Orifice plates shall be of concentric type, designed and manufactured as per BS-1042 / ISO 5167. The data sheet enclosed specifies the requirements of each orifice plate assembly. The bidder shall calculate the Beta ratio and validate suitability of the selected design for the specified application, Vent holes, if required for the specified duty shall be located at the top and drain holes at the bottom of the orifice.

3.1.2 Material: The material of the Orifice plates shall be stainless steel type SS 316, unless otherwise specified.

3.1.3 Orifice Plate thickness shall be >= 3 mm (min.) for pipes having diameter <= 300 mm and shall be >=6mm (min.) for pipes having diameter above 300 mm.

3.1.4 Assembly: Orifice plates shall be supplied as complete assemblies, along with companion flanges on both sides having proper end connection for welding on to the associated pipe at site, gaskets, nuts & bolts. The carrier ring assembly shall be supplied along with corner taps for orifice assembly having sizes <= 2 inches (max.), if specified in the data sheet. End flanges along with Counter flanges shall be provided as per requirement. Concentric Square edge orifice shall be provided with downstream beveled edge.

Each flow orifice assembly shall be provided with minimum three pairs of pressure tapping suitable for the service conditions. The pressure tapping shall be provided either on the carrier ring or on the companion flanges as the case may be.
Extra pressure tapping (other than the three tapping's mentioned above) and other accessories shall be provided in case to case basis for a specific project if required.
Each orifice plate or the carrier ring assembly (as the case may be) will also be provided with an extended handle. The Tag No. and duty will be permanently marked on both the sides of this handle.

3.1.5 Flanges: The flanges shall conform to latest revisions of ASME B16.36 / ASME B16.47 (B). The companion flange and the carrier ring material shall be same as that of the main pipe. These shall be manufactured from forged material. Companion flanges shall be suitably rated for the specified service conditions.

3.1.6 Hydraulic test pressure for Assembly shall be 1.5 times of the design pressure at normal temperature.

3.1.7 While machining the ID to maintain a uniform internal diameter, care shall be taken to ensure the minimum thickness of the branch pipe as per IBR regulations.

3. 2 Guarantee & Performance
The guarantee for the flow orifice assemblies shall be for 12 months continuous operation from the date of commissioning.

4.0 TESTS & INSPECTION

4.1 The equipment covered under this specification shall be subject to vendor's quality plan to be approved by the purchaser before start of manufacturing. To ensure that quality is in-built in each equipment the quality assurance system manual indicating the system followed by the vendor shall be submitted to purchaser for his review.

4.2 The quality plan forming part of this specification shall be the minimum requirements for the vendor's quality plan to be submitted with the offer. The vendor shall give at least 15 days written notice to purchaser for witnessing the tests/inspection at various stages. The expenses for all such tests/inspection shall be to manufacturer's account except for the expenses of purchaser's representatives witnessing the tests. The purchaser shall attend such tests/inspection within 15 days failing which the manufacturer may proceed with the tests which shall be deemed to have been made in purchaser's presence and shall furnish relevant test certificates to the purchaser.

4.3 One orifice plate of each type and size for each project unless specified shall be tested andcalibrated by the bidder at customer/BHEL approved laboratory, within his quoted price. Details of thecalibration test i.e., type of test, equipment's employed etc. shall be submitted in the bid.

4.4 IBR certification, if required for the specified service shall be obtained by the successful bidder from the concerned authority for submission to the purchaser.

4.5 The Standard QP is included in this specification to enable bidder to understand the extent of inspection and testing requirements to execute this job. The successful bidder has to follow the agreed QP, taking care of customer requirements mentioned in Sec-C and submit QP for final approval by BHEL / Customer.

5.0 DRAWINGS & DOCUMENTS

(A) With the Technical Bid along with the Enquiry:

Following documents shall be submitted:

a) Quality plan duly signed and stamped.
b) Datasheet A duly signed and stamped.
c) Schedule of submission of Drg. / Doc, Equip. Manufacture, Inspection and Dispatch.
d) Inspection schedule.
e) Unpriced bid format of Price Schedule.

(B) After the award of project specific contract :

The documentation as listed below to be submitted, separately for respective projects.

a. Assembly drawing of all type of Flow Element assemblies complete with all accessories indicating detailed dimensions, BOM and weights.
b. Flow Element Edge preparation details.
c. Installation drawings for the flow elements.
d. Technical Data sheet-C completely filled-up..
e. Quality Plan duly signed and stamped.

f. Bore size calculations for Flow orifices for all the conditions indicated in the data sheets.
g. Differential Pressure Vs Flow, curve for each Orifice.
h. All relevant catalogues for the models of the Flow Element Assemblies as well as accessories finalized.
i. Bar chart to indicate the time schedule for procurement, manufacture, testing and dispatch.

(C) Final documentation for a project:

Final documentation shall contain 20 sets with 4 CD-ROMS of each of the following:

1. Category –I & IV Approved final drawings/data sheets, Bore sizing calculations, DP Vs Flow Curve for each Orifice.
2. Verified test certificates
3. Approved Quality Plan
4. Calibrations Reports
5. Quality Inspection Report
6. Operation & Maintenance Manuals for Flow Element Assemblies and all the accessories (Containing storage & commissioning instructions).

6.0 PACKING & MARKING

6.1 Packing:Each orifice plate assembly and the associated accessories shall be packed properly with adequate protection against friction, stresses, vibrations and shocks during transportation. Each packing shall have markings as per Purchase Order / Special Condition of the Contract (SCC).
Sea Worthy packing (if applicable) shall be provided by the bidder without any commercial implication.
Inspection of the sea worthy packings hall be done as per project specific sea worthy packing specification by BHEL / BHEL appointed inspection agency.

6.2 Marking: Each flow element assembly shall be identified with the following information:

- Tag Number
- Service
- Element Material
- Beta ratio
- Line size & thickness
- Direction of flow

7.0 APPLICABLE DATA SHEET FORMS

This document shall be read with one or more of the following data sheet forms:
- Data sheet A for Flow Orifice:

	TECHNICAL SPECIFICATION FOR FLOW ELEMENT ORIFICE(Along with Accessories) 2 X 500 MW NTPC MAUDA STAGE-I FGD SYSTEM PACKAGE	SPEC NO.: **PE-TS-444-145-I105**	
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		SECTION C	
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SECTION-D

DATA SHEETS - A&B

1190141/2022/PS-PEM-C I

FORM NO. PEM-6666-0

BHEL	**DATA SHEET FOR FLOW ELEMENTS (ORIFICE) FOR 2 X 500 MW NTPC MAUDA STAGE-I FGD SYSTEM PACKAGE**	SPECIFICATION NO.: PE-TS-444-145-I105	
		VOLUME: IIB	
		SECTION: D	
		REV. NO. 00	DATE 01.12.2022
		SHEET	

Tag No. : **PGB05BP001** Data Sheet No. PES-145-05-DS1-0

DATA SHEET – A & B

DATA SHEET – A (TO BE FILLED UP BY PURCHASER)			DATA SHEET – B (TO BE FILLED UP BY BIDDER)
GENERAL*	PROJECT OFFER REFERENCE QUANTITY SERVICE MAKE : MODEL	**NTPC - 2X500 MW MAUDA FGD** Bidder to specify ONE (1) **ECW (FGD) PUMP DISCHARGE HEADER** Bidder to specify	....
ELEMENT	TYPE STANDARD DESIGN THICKNESS MATERIAL BETA RATIO BORE DIAMETER VENT HOLE DRAIN HOLE	ORIFICE ISO 5167 / BS 1042 SQ EDGE 3mm SS316 0.34 TO 0.7 Bidder to specify YES NO	....
END CONNECTION	TYPE FLANGE TYPE FLANGE RATING : MATERIAL TAPPING LOCATION NUMBER OF TAPPINGS NIPPLE : QTY NIPPLE : RATING NIPPLE : MATERIAL NIPPLE : SIZE	FLANGED WELD NECK, BUTT WELD END ANSI – 300 : ASTM A 105 ON FLANGE [■] 3 PAIR [] OTHER 6 NOS. : 250mm LONG SCH.80 SS316 15NB	....
PROCESS DATA	FLUID FLOW (T/HR) PRESSURE (KG/CM^2 (A)) TEMPERATURE (DEG. C.) DESIGN PRESS : TEMP MAX. ALLOWABLE PRESS LOSS DIFF. PRESS AT MAX FLOW	[] CONDENSATE [] FEED WATER [] STEAM [■] DMCW [] OTHER MAX. NORMAL MINIMUM 325 250 75 6.0 5.5 4.0 38.0 38.0 38.0 10 Kg/cm^2(g) : 60 ºC 0.15 Kg/cm^2 Bidder to specify	....

1190141/2022/PS-PEM-C I

FORM NO. PEM-6666-0

BHEL	**DATA SHEET FOR FLOW ELEMENTS (ORIFICE) FOR 2 X 500 MW NTPC MAUDA STAGE-I FGD SYSTEM PACKAGE**	SPECIFICATION NO.: PE-TS-444-145-I105 VOLUME: IIB SECTION: D REV. NO. 00 DATE 01.12.2022 SHEET

Tag No. : **PGB05BP001**

Data Sheet No. PES-145-05-DS1-0

DATA SHEET – A & B

DATA SHEET – A (TO BE FILLED UP BY PURCHASER)			DATA SHEET – B (TO BE FILLED UP BY BIDDER)
PIPE LINE DATA	PIPE SIZE (OD x THK) mm PIPE MATERIAL BORE DIAMETER mm MIN. AVAILABLE STRAIGHT LENGTH UPSTREAM : DOWNSTREAM FLOW DIRECTION	273.0 x6.0 Carbon Steel IS 2062 Bidder to specify 10 D : 5 D [■] HORIZONTAL [] VERTICAL UP [] VERTICAL DOWN	....
OTHER INFORMATION	IBR CERTIFICATION TOTAL WEIGHT OF FLOW ELEMENT AND ACCESSORIES COMMISIONING SPARE	[] REQUIRED [■] NOT REQUIRED [■] REQUIRED ONE PAIR OF GASKET FOR EACH ORIFICE ASSEMBLY	

NOTES:

1. FLOW ELEMENT ACCURACY IS REQUIRED BETWEEN 75 T/HR TO 325 T/HR.
2. RECOMMENDED RANGE IS 0 – 355 T/HR.
3. S BAND SHALL BE PROVIDED BY THE BIDDER IN CASE FLOW DIRECTION IS VERTICAL

1190141/2022/PS-PEM-C I

FORM NO. PEM-6666-0

BHEL	**DATA SHEET FOR FLOW ELEMENTS (ORIFICE) FOR 2 X 500 MW NTPC MAUDA STAGE-I FGD SYSTEM PACKAGE**	SPECIFICATION NO.: PE-TS-444-145-I105 VOLUME : IIB SECTION : D REV. NO. 00 DATE 01.12.2022 SHEET

Tag No. : **PGB90BP001** Data Sheet No. PES-145-05-DS1-0

DATA SHEET – A & B

DATA SHEET – A (TO BE FILLED UP BY PURCHASER)			DATA SHEET – B (TO BE FILLED UP BY BIDDER)
GENERAL*	PROJECT OFFER REFERENCE QUANTITY SERVICE MAKE : MODEL	**NTPC - 2X500 MW MAUDA FGD** Bidder to specify ONE (1) **ECW (FGD) RETURN HEADER** Bidder to specify	....
ELEMENT	TYPE STANDARD DESIGN THICKNESS MATERIAL BETA RATIO BORE DIAMETER VENT HOLE DRAIN HOLE	ORIFICE ISO 5167 / BS 1042 SQ EDGE 3mm SS316 0.34 TO 0.7 Bidder to specify YES NO	....
END CONNECTION	TYPE FLANGE TYPE FLANGE RATING : MATERIAL TAPPING LOCATION NUMBER OF TAPPINGS NIPPLE : QTY NIPPLE : RATING NIPPLE : MATERIAL NIPPLE : SIZE	FLANGED WELD NECK, BUTT WELD END ANSI – 300 : ASTM A 105 ON FLANGE [■] 3 PAIR [] OTHER 6 NOS. : 250mm LONG SCH.80 SS316 15NB	....
PROCESS DATA	FLUID FLOW (T/HR) PRESSURE (KG/CM^2 (A)) TEMPERATURE (DEG. C.) DESIGN PRESS : TEMP MAX. ALLOWABLE PRESS LOSS DIFF. PRESS AT MAX FLOW	[] CONDENSATE [] FEED WATER [] STEAM [■] DMCW [] OTHER MAX. NORMAL MINIMUM 325 250 75 6.0 5.5 4.0 38.0 38.0 38.0 10 Kg/cm^2(g) : 60 ^{o}C 0.15 Kg/cm^2 Bidder to specify	....

BHEL	**DATA SHEET FOR FLOW ELEMENTS (ORIFICE) FOR 2 X 500 MW NTPC MAUDA STAGE-I FGD SYSTEM PACKAGE**	SPECIFICATION NO.: PE-TS-444-145-I105 VOLUME : IIB SECTION : D REV. NO. 00 DATE 01.12.2022 SHEET

Tag No. : **PGB90BP001**

Data Sheet No. PES-145-05-DS1-0

DATA SHEET – A & B

DATA SHEET – A (TO BE FILLED UP BY PURCHASER)			DATA SHEET – B (TO BE FILLED UP BY BIDDER)
PIPE LINE DATA	PIPE SIZE (OD x THK) mm PIPE MATERIAL BORE DIAMETER mm MIN. AVAILABLE STRAIGHT LENGTH UPSTREAM : DOWNSTREAM FLOW DIRECTION	273.0 x6.0 Carbon Steel IS 2062 GR.B Bidder to specify 10 D : 5 D [■] HORIZONTAL [] VERTICAL UP [] VERTICAL DOWN	....
OTHER INFORMATION	IBR CERTIFICATION TOTAL WEIGHT OF FLOW ELEMENT AND ACCESSORIES COMMISIONING SPARE	[] REQUIRED [■] NOT REQUIRED [■] REQUIRED ONE PAIR OF GASKET FOR EACH ORIFICE ASSEMBLY	

NOTES:

1. FLOW ELEMENT ACCURACY IS REQUIRED BETWEEN 75 T/HR TO 325 T/HR.
2. RECOMMENDED RANGE IS 0 – 355 T/HR.
3. S BAND SHALL BE PROVIDED BY THE BIDDER IN CASE FLOW DIRECTION IS VERTICAL.

	DATA SHEET FOR FLOW ELEMENTS (ORIFICE) FOR 2 X 500 MW NTPC MAUDA STAGE-I FGD SYSTEM PACKAGE	SPECIFICATION NO.: PE-TS-444-145-I105A	
		VOLUME : IIB	
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		SHEET	

Tag No. : **PCB40BP001** Data Sheet No. PES-145-05-DS1-0

DATA SHEET – A & B

DATA SHEET – A (TO BE FILLED UP BY PURCHASER)			DATA SHEET – B (TO BE FILLED UP BY BIDDER)
GENERAL*	PROJECT OFFER REFERENCE QUANTITY SERVICE MAKE : MODEL	**NTPC - 2X500 MW MAUDA FGD** Bidder to specify ONE (1) **SCS OUTLET HEADER** Bidder to specify	....
ELEMENT	TYPE STANDARD DESIGN THICKNESS MATERIAL BETA RATIO BORE DIAMETER VENT HOLE DRAIN HOLE	ORIFICE ISO 5167 / BS 1042 SQ EDGE 3mm SS316 0.34 TO 0.7 Bidder to specify YES NO	....
END CONNECTION	TYPE FLANGE TYPE FLANGE RATING : MATERIAL TAPPING LOCATION NUMBER OF TAPPINGS NIPPLE : QTY NIPPLE : RATING NIPPLE : MATERIAL NIPPLE : SIZE	FLANGED WELD NECK, BUTT WELD END ANSI – 300 : ASTM A 105 ON FLANGE [■] 3 PAIR [] OTHER 6 NOS. ; 250mm LONG SCH.80 SS316 15NB	....
PROCESS DATA	FLUID FLOW (T/HR) PRESSURE (KG/CM^2 (A)) TEMPERATURE (DEG. C.) DESIGN PRESS : TEMP MAX. ALLOWABLE PRESS LOSS DIFF. PRESS AT MAX FLOW	[] CONDENSATE [] FEED WATER [] STEAM [■] ACW [] OTHER MAX. NORMAL MINIMUM 325 250 75 3.5 3.0 2.5 36 36 36 7.5 Kg/cm^2(g) : 60 ºC 0.15 Kg/cm^2 Bidder to specify	....

BHEL	**DATA SHEET FOR FLOW ELEMENTS (ORIFICE) FOR 2 X 500 MW NTPC MAUDA STAGE-I FGD SYSTEM PACKAGE**	SPECIFICATION NO.: PE-TS-444-145-I105A VOLUME : IIB SECTION : D REV. NO. 00 DATE 01.12.2022 SHEET

Tag No. : **PCB40BP001** Data Sheet No. PES-145-05-DS1-0

DATA SHEET – A & B

DATA SHEET – A (TO BE FILLED UP BY PURCHASER)			DATA SHEET – B (TO BE FILLED UP BY BIDDER)
PIPE LINE DATA	PIPE SIZE (OD x THK) mm PIPE MATERIAL BORE DIAMETER mm MIN. AVAILABLE STRAIGHT LENGTH UPSTREAM : DOWNSTREAM FLOW DIRECTION	219.1 x 6.00 Carbon Steel IS 2062 GR. B Bidder to specify 10 D : 5 D [■] HORIZONTAL [] VERTICAL UP [] VERTICAL DOWN	....
OTHER INFORMATION	IBR CERTIFICATION TOTAL WEIGHT OF FLOW ELEMENT AND ACCESSORIES COMMISIONING SPARE	[] REQUIRED [■] NOT REQUIRED [■] REQUIRED ONE PAIR OF GASKET FOR EACH ORIFICE ASSEMBLY	

NOTES:

1. FLOW ELEMENT ACCURACY IS REQUIRED BETWEEN 75 T/HR TO 325 T/HR.
2. RECOMMENDED RANGE IS 0 – 355 T/HR.
3. S BAND SHALL BE PROVIDED BY THE BIDDER IN CASE FLOW DIRECTION IS VERTICAL.

FORM NO. PEM-6666-0

BHEL	TECHNICAL SPECIFICATION FOR FLOW ELEMENT ORIFICE(Along with Accessories) 2 X 500 MW NTPC MAUDA STAGE-I FGD SYSTEM PACKAGE	SPEC NO.: **PE-TS-444-145-I105** VOLUME II B SECTION D REV. NO. 00 DATE : 01.12.2022 SHEET

SECTION-D

QUALITY PLAN

	MANUFACTURER / BIDDER / SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO:	DATE:
		CUSTOMER :		QP NO.:PE-QP-999-145-I024, Rev No.:00	DATE:17.04.2020
		PROJECT:		PO NO.:	DATE:
		ITEM: FLOW ORIFICE	SYSTEM: C&I	SECTION:	SHEET 1 OF 2

SNo.	Component & Operations	Characteristics	Class	Type of Check	Quantum of check		Reference document	Acceptance norms	Format of record	*	Agency			Remarks
1.0	2	3	4	5	6		7	8	9	*	**			10
					M	C/N				D	M	C	N	
1.1	MATERIAL													
	Orifice Plate	Physical, Chemical properties	MA	Physical, Chemical tests	1/Heat	—	Approved Drg / Data Sheet	Approved Drg / data Sheet	Test Certificate	√	P, V	V	-	Refer Note-1, IBR certification(if applicable) to be verified by BHEL
		Dimensions	MA	Measurement	100%	—	Approved Drg / Data Sheet	Approved Drg / Data Sheet	Inspection Reports	√	P,V	V	-	
1.2	FLANGES													
	a. Forgings	Chemical, Mech Properties, & Heat Treatment	MA	Chemical, Mech Properties, & Heat Treatment	100%	—	ANSI B 16.34	ANSI B 16.34	MTC Cert,HT certificate	√	P, V	V	-	Refer Note-1 & 2
		UT	MA	UT test	100%	—	Material Spec as per ASTM A 388	Material Spec as per ASTM A 388	UT Certificate	√	P, V	V	-	
	b. Machining	Dimensions	MA	Measurement	100%	—	Approved Drg / Data Sheet	Approved Drg / Data Sheet	Inspection Reports	√	P, V	V	-	
2.0	IN PROCESS													
	Machine	Dimension	MA	Measurement	100%	—	Approved Drg / Data Sheet	Approved Drg / data Sheet	Inspection Reports	√	P, W	V	-	
		Surface finish	MA	Visual	100%	—	—	Mirror Finish	—	√	P, W	V	-	
		Surface flaw on machined surface	MA	Penetrant test	100%	—	ASTM 165 / IS:3658	ASTM 165 / IS:3658	Inspection Reports / Test Certificate	√	P, W	V	-	
3.0	ASSEMBLY and FINAL INSPECTION													
		Overall dimensions	MA	Measurement	100%	100%	Approved Drg / Data Sheet	Approved Drg / data Sheet	Inspection Reports	√	P, W	W	-	
		Marking, Tag no. Direction of flow	MA	Visual	100%	100%	Approved Drg / Data Sheet	Approved Drg / data Sheet	Inspection Reports	√	P, W	W	-	

BHEL						BIDDER/ SUPPLIER		FOR CUSTOMER REVIEW & APPROVAL			
ENGINEERING			QUALITY			Sign & Date		Doc No:			
	Sign & Date	Name		Sign & Date	Name	Seal			Sign & Date	Name	Seal
Prepared by:	Jain 31/8/2020	PRAG JAIN / MAYANK KESHARWANI	Checked by:	Kundan 31/08/2020	KUNDAN PRASAD			Reviewed by:			
Reviewed by:	31/08/2020	BHARAT SINGH	Reviewed by:	31/8/2020	RITESH KUMAR JAISWAL			Approved by:			

BHEL	MANUFACTURER / BIDDER / SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO: / DATE:
		CUSTOMER :		QP NO.:PE-QP-999-145-I024, Rev No.:00 / DATE:17.04.2020
		PROJECT:		PO NO.: / DATE:
		ITEM: FLOW ORIFICE	SYSTEM: C&I	SECTION: / SHEET 2 OF 2

SNo.	Component & Operations	Characteristics	Class	Type of Check	Quantum of check		Reference document	Acceptance norms	Format of record	*	Agency			Remarks
1	2	3	4	5	6		7	8	9	*	**			10
					M	C/N				D	M	C	N	
		Calibration	MA	Performance test	One per type	---	Approved Data Sheet	Approved Data Sheet	Test Certificate	√	P, W	V	-	Refer Note 4
		Painting	MA	Visual	100%	---	Manufacturer standards	Manufacturer standards	Inspection Reports / Manufacturer records	√	P, W	V	-	
		Root valve BOQ & Access.	MA	Measurement	100%	100%	Approved Drg / Data Sheet	Approved Drg / Data Sheet	Inspection Reports	√	P, W	W	-	Quantity to be checked physically
4.0	PACKING & DISPATCH	Soundness of Packing against transit damage	MA	Visual	100%	100%	Tech. Spec / Manufacturer standards	Tech. Spec / Manufacturer standards	---	√	P	W	-	Refer Note 10

NOTE:

1. All test reports & dimension reports shall be verified by BHEL wherever verification is by BHEL at the time of Final Inspection.
2. Positive material identification testing (One per type) shall be performed by vendor and the same shall be witnessed by BHEL at the time of final inspection
3. Minimum 2 coats of primer paint to be applied before dispatch (Painting thickness shall be as per Manufacturer's standard)
4. CALIBRATION Test to be carried out at IIT-DELHI / FCRI or NABL approved laboratory.
5. BHEL reserves the right to conduct repeat tests, if required.
6. In case of foreign supplier, all test certificates shall be furnished by the supplier, duly witnessed / verified by supplier's TPI.
7. Project specific QP will be prepared based on customer requirement
8. The latest revisions / year of issue of all the standard indicated in the QP shall be referred.
9. Quantum of check by BHEL / BHEL nominated inspection agency shall be indicated during project specific enquiry.
10. Following to be noted for packing:
    a) Material shall be packed suitably in order to avoid damage during transit and also during storage at site.
    b) Photograph of flow element shall be provided, duly packed inside the wooden box just before final packing
    c) Photographs of the packing (with LR No.) shall be provided as per approved packing procedure (if applicable) just before dispatch.
    d) Clearance for dispatch will be given only after receipt of the photos
    e) Sea worthy packing shall be provided, if called for in the Data Sheet. Acceptance norms shall be in line with technical / packing specification.

LEGEND:

*RECORDS, INDENTIFIED WITH "TICK"(√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.**D**: DOCUMENTATION

** **M**: SUPPLIER/ MANUFACTURER/ SUB-SUPPLIER, **C**: MAIN SUPPLIER/ BHEL/ THIRD PARTY INSPECTION AGENCY, **N**: CUSTOMER,

P: PERFORM, **W**: WITNESS, **V**: VERIFICATION, AS APPROPRIATE, **MA**:MAJOR,**MI**:MINOR,**CR**:CRITICAL.

Root valves not in bidder's scope of supply.

BHEL						BIDDER/ SUPPLIER		FOR CUSTOMER REVIEW & APPROVAL			
ENGINEERING			QUALITY			Sign & Date		Doc No:			
	Sign & Date	Name		Sign & Date	Name	Seal			Sign & Date	Name	Seal
Prepared by:	Jain 31/8/2020	PRAG JAIN / MAYANK KESHARWANI	Checked by:	Kundan 31/08/2020	KUNDAN PRASAD			Reviewed by:			
Reviewed by:	31/08/2020	BHARAT SINGH	Reviewed by:	31/8/2020	RITESH KUMAR JAISWAL			Approved by:			

	TECHNICAL SPECIFICATION FOR FLOW ELEMENT ORIFICE (Along with accessories) 2 X 500 MW NTPC MAUDA STAGE-I FGD SYSTEM PACKAGE	SPEC NO.: PE-TS-444-145-I105
		VOLUME II B
		SECTION D
		REV. NO. 00 / DATE : 01.12.2022
		SHEET

SECTION-D

BILL OF QUANTITY

	Technical specification for **FLOW ELEMENT ORIFICE** **(Along with Accessories)** **2 X 500 MW NTPC MAUDA STAGE-I** **FGD SYSTEM PACKAGE**	SPECIFICATION NO. **PE-TS-444-145-I105** VOLUME **II-B** SECTION **D** REV. NO. 00 | DATE 01.12.2022 SHEET

BILL OF QUANTITY

(A) FLOW ELEMENT ASSEMBLIES COMPLETE WITH Three (3) pairs of tappings, ACCESSORIES, like Gasket, Pressure take-off points, Nipples etc. and commissioning spare of 1 No. of gasket for EACH TAG FOR EACH UNIT.

ROOT VALVES shall be under BHEL scope of supply.

S. No.	KKS	SERVICE/ ITEM DESCRIPTION	FLUID	Quantity for Units (in Nos.)
1	PGB05BP001	ECW (FGD) PUMP DISCHARGE HEADER	DMCW	1
2	PGB90BP001	ECW (FGD) RETURN HEADER	DMCW	1
3	PCB40CP001	SCS OUTLET HEADER	ACW	1

[B] START-UP / COMMISSIONING SPARES FOR FLOW ELEMENT ASSEMBLIES

SNo	DESCRIPTION	TOTAL QUANTITY
1	PAIR OF GASKETS FOR FLOW ORIFICES	ONE (1) PAIR FOR EACH TAG FOR EACH UNIT

[C] CALIBERATION CHARGES

S. No.	KKS	SERVICE/ ITEM DESCRIPTION	FLUID	Quantity for Units (in Nos.)
1	PGB05BP001	ECW (FGD) PUMP DISCHARGE HEADER	DMCW	1
2	PGB90BP001	ECW (FGD) RETURN HEADER	DMCW	1
3	PCB40CP001	SCS OUTLET HEADER	ACW	1

	PRE-QUALIFICATION REQUIREMENTS FOR VENDOR REGISTRATION PROJECT : **2X500 MW MAUDA FGD**	PE-QP-444-145-I003 REVISION NO. 00 DATE 01.12.22 SHEET NO. 1 OF 1

PACKAGE: **FLOW ORIFICE**

1.0	
a.	The bidder should be Original Equipment Manufacturer(OEM) for FLOW ORIFICE
b.	In case the bidder is not OEM, evaluation shall be done as following : 1. If bidder happens to be Indian subsidiaries of foreign OEM, then the credentials of the foreign OEM can also be considered for meeting PQR. 2. If bidder happens to be Authorized channel partner or having a valid collaboration agreement / licensing agreement with some other company or being a Joint Venture Company, then the credentials of collaborator / licensing company / Principal company /JV partner can also be considered for meeting PQR as per scope of the work. The scope matrix shall include their respective roles including design vetting, manufacturing of critical component and warranty/guarantee. If supplier(s) qualifies on the basis of credentials of his principal/JV partner/Collaborator etc., then the principal/JV partner/Collaborator shall be responsible for overall design vetting and warranty/guarantee of the package.
2.0	The Product being offered by the bidder should be in use successfully in power plant or any other industrial application for at least **1 (One)** year. Bidder to submit either of following supporting documents for the product: a. Copy of minimum **1 (One)** Performance Certificate from end user / customer certifying that product has been running satisfactorily for **1 (One)** year from date of commissioning to the date of application. The certificate should clearly indicate date of commissioning, date of issue of certificate and name/designation of the certificate issuer. Copy of purchase order & technical parameter to be attached along with the performance certificate. OR b. Copy of repeat orders from minimum **2 (Two)** different purchasers. Order received by supplier from same purchaser with a gap of minimum **2 (Two)** years shall be considered as repeat order. Copy of technical parameters for each order to be attached.
3.0	The bidder to furnish experience list of last 5 years indicating Customer name, Purchase Order reference, item supplied & year of supply to establish the continuity of business.
4.0	The bidder to submit all documents in English. If documents submitted by the bidder are in language other than English, a self-attested English translated document shall be submitted.

31/12/2022	03.12.2022	31/12/22
PREPARED BY CHETAN MALIK SR. MGR-C&I	CHECKED BY S.S. BANSALA DGM-C&I	APPROVED BY DIPESH PALIT GENERAL MANAGER (C&I, NEW BUSINESS GROUP, IPDS, DTG & PPDC)

CORPORATE QUALITY ASSURANCE/ कॉरपोरेट गुणवत्ता आश्वासन

MAIN CONTRACTOR'S PROPOSAL CUM EVALUATION REPORT

मुख्य संविदाकार प्रस्ताव सह मुल्यांकन रिपोर्ट

Ref No: संदर्भ सं.:			***Date:*** तिथिः		
i.	***Main Contractor*** मुख्य संविदाकार				
ii.	***Project*** परियोजना				
iii.	***Package Name*** पैकेज का नाम		***Package No*** पैकेज सं.		
iv.	***Proposed Item/Scope of Sub-contracting*** उप-संविदा(अनुबंध) का प्रस्तावित मद/ दायरा				
v.	***Item covered under*** *निम्नलिखित के अंतर्गत शामिल मद*	***Schedule-1*** */अनुसूची-* ***1***	☐	***As per contract clause No-*** *अनुबंध के अनुसार खंड सं.--* **-**	
		Schedule-2 *अनुसूची-* ***-2***	☐		
vi.	***If item is Schedule-1 and proposed sub-vendor is indigenous, Main Contractor to explain how the contractual provisions will be fulfilled*** /यदि मद अनुसूची -**1** है और प्रस्तावित उप-विक्रेता स्वदेशी है, तो मुख्य संविदाकार को स्पष्ट करना होगा कि संविदा/अनुबंध के प्रावधान कैसे पूरे किए जाएंगे				
vii.	***Name and Address of the proposed Sub-vendor's works*** /प्रस्तावित सब-वेंडर का नाम तथा पता				
viii.	***PO placement date/ Start of manufacturing (if self-manufactured) as per L2 network*** **पीओ नियोजन की तिथि / एल-** 2 **नेटवर्क के अनुसार विनिर्माण (यदि स्व-निर्मित है) की शुरुआत**				

ix.	***Item Description (Type/Size/Rating/Scope of Sub-Contracting)*** मद का विवरण (प्रकार / आकार / रेटिंग / उप-अनुबंध का दायरा)	***Total quantity of proposed item envisaged in this package (Nos/ Running Meters/ Kgs/ Tons etc)*** इस पैकेज में परिकल्पित प्रस्तावित मद की कुल मात्रा (संख्या / क्रियाशील मीटर / किलोग्राम / टन आदि)	***Quantity proposed to be procured from proposed sub-vendor (Nos/ Running Meters /Kgs /Tons etc)*** प्रस्तावित उप-विक्रेता (संख्या / क्रियाशील मीटर / किलोग्राम / टन आदि) से खरीदी जाने वाली मात्रा	***Timeline for quantity requirements as per project schedule & whether the proposed Sub-vendor equipped with adequate capacity to supply proposed order quantity in time /*** परियोजना समय सूची के अनुसार मात्रा आवश्यकताओं के लिए समय-सीमा और क्या प्रस्तावित उप-विक्रेता समय पर प्रस्तावित मांग की मात्रा की आपूर्ति करने में पूरी तरह से सक्षम है

CORPORATE QUALITY ASSURANCE/ कॉरपोरेट गुणवत्ता आश्वासन

MAIN CONTRACTOR'S PROPOSAL CUM EVALUATION REPORT

मुख्य संविदाकार प्रस्ताव सह मुल्यांकन रिपोर्ट

x.	***Supply experience of the proposed sub-vendor (including supplies to Main Contractor, if any) for similar item/scope of sub-contracting, for last 3 years (Note:- Only relevant experience details w.r.t. proposed item/scope of subcontracting to be brought out here)*** पिछले 3 वर्षों के लिए उप-अनुबंध के समान मद / दायरे के लिए प्रस्तावित सब-वेंडर (मुख्य संविदाकार हेतु आपूर्ति, यदि कोई हो, सहित) का आपूर्ति अनुभव (नोट: - उप-अनुबंध के प्रस्तावित मद / दायरे के संबंध में केवल प्रासंगिक अनुभव के विवरण का उल्लेख हो

Project/Package परियोजना/पैकेज	***Customer Name*** ग्राहक का नाम	***Supplied Item (Type/Rating/Model /Capacity/Size etc)*** आपूर्त्तित मद (प्रकार/रेटिंग /मॉडल /क्षमता/आकार आदि)	***PO ref no/date*** पीओ संदर्भ सं. /तिथि	***Supplied Quantity*** आपूर्ति की मात्रा	***Date of Supply*** आपूर्त्ति की तिथि

We confirm that as per our assessment, the proposed sub-vendor has requisite capabilities & supply experience and is suitable for supplying the proposed item/scope of sub-contracting/हम अपने आकलन के अनुसार इस बात की पुष्टि करते हैं कि, प्रस्तावित उप-विक्रेता के पास अपेक्षित क्षमता और आपूर्ति करने का अनुभव है और उप-अनुबंध के दायरे /प्रस्तावित मद की आपूर्ति के लिए उपयुक्त है।

Name: नाम:		***Desig:*** पद:		***Contact No:*** दूरभाष सं.:		***Sign:*** हस्ताक्षर:		***Date:*** तिथि:	

Company's Seal/Stamp:- कंपनी का मुहर:-

	संख्या, उनकी योग्यता, मशीन और उपलब्ध उपकरण आदि)	***(if applicable)*** लागू / लागू नहीं, अगर विनिर्माण मुख्य संविदाकार / खरीददार के डिजाइन के अनुसार है) विवरण अनुलग्नक –एफ 2.2 पर संलग्न है। (यदि लागू हो)
7.	***Overall organization Chart with Manpower Details (Design/Manufacturing/Quality etc)*** मैनपावर विवरण के साथ समग्र संगठन का चार्ट(डिजाइन / विनिर्माण / गुणवत्ता आदि)	***Details attached at Annexure – F2.3*** विवरण अनुलग्नक – F2.3 में संलग्न है।
8.	***After sales service set up in India, in case of foreign sub-vendor(Location, Contact Person, Contact details etc.)*** भारत में बिक्री सेवा की स्थापना के बाद, विदेशी उप-विक्रेता के मामले में(स्थल , संपर्क व्यक्ति, संपर्क विवरण आदि)	***Applicable / Not applicable*** लागू / लागू नहीं ***Details attached at Annexure – F2.4*** विवरण अनुलग्नक -2.4 पर संलग्न है।
9.	***Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any*** फ्लोचार्ट सहित विनिर्माण प्रक्रिया निष्पादन योजना , जिसमें आउटसोर्स प्रक्रिया, यदि कोई हो, सहित कच्चे माल से तैयार उत्पाद तक विनिर्माण के विभिन्न चरणों को दर्शाया गया हो,	***Details attached at Annexure – F2.5*** विवरण अनुलग्नक - F2.5में संलग्न है।
10.	***Sources of Raw Material/Major Bought Out Item*** कच्चे माल के स्रोत / खरीदे हुए मुख्य मद	***Details attached at Annexure – F2.6*** विवरण अनुलग्नक - F2.6में संलग्न है।
11.	***Quality Control exercised during receipt of raw material/BOI, in-process , Final Testing, packing*** कच्चे माल / खरीदे हुए मद, प्रक्रियाबद्ध, अंतिम परीक्षण, पैकिंग करते समय गुणवत्ता नियंत्रण	***Details attached at Annexure – F2.7*** विवरण अनुलग्नक - F2.7 पर संलग्न है
12.	***Manufacturing facilities (List of machines, special process facilities, material handling etc.)*** विनिर्माण सुविधा(मशीनों की सूची , विशेष प्रक्रिया सुविधाएं, सामग्री रख-रखाव आदि)	***Details attached at Annexure – F2.8*** विवरण अनुलग्नक - F2.8में संलग्न है।
13.	***Testing facilities (List of testing equipment)*** परीक्षण सुविधाएं(परीक्षण उपकरण की सूची)	***Details attached at Annexure – F2.9*** विवरण अनुलग्नक – F2. 9 में संलग्न है।
14.	***If manufacturing process involves fabrication then-*** यदि निर्माण प्रक्रिया में फेब्रिकेशन की गई है तो-	***Applicable / Not applicable*** लागू / लागू नहीं ***Details attached at Annexure – F2.10*** विवरण अनुलग्नक - F2.10में संलग्न है।
	List of qualified Welders पात्र वेल्डर की सूची	

CORPORATE QUALITY ASSURANCE/ कॉरपोरेट गुणवत्ता आश्वासन

SUB-VENDOR QUESTIONNAIRE/ सब-वेंडर प्रश्नावली

i.	***Item/Scope of Sub-contracting*** **उप-संविदा(अनुबंध) का मद/ दायरा**			
ii.	***Address of the registered office*** पंजीकृत कार्यालय का पता	***Details of Contact Person*** संपर्क व्यक्ति का विवरण ***(Name, Designation, Mobile, Email)*** (नाम, पदनाम, मोबाइल, ईमेल)		
iii.	***Name and Address of the proposed Sub-vendor's works where item is being manufactured*** प्रस्तावित उप-विक्रेता के कार्यों का नाम और पता, जहां मद का निर्माण किया जा रहा है	***Details of Contact Person:*** संपर्क व्यक्ति का विवरण ***(Name, Designation, Mobile, Email)*** (नाम, पदनाम, मोबाइल, ईमेल)		
iv.	***Annual Production Capacity for proposed item/scope of sub-contracting*** **उप-संविदा(अनुबंध)** के प्रस्तावित मद / दायरे के लिए वार्षिक उत्पादन क्षमता			
v.	***Annual production for last 3 years for proposed item/scope of sub-contracting*** **उप-संविदा(अनुबंध)** के प्रस्तावित मद / दायरे के लिए पिछले 3 वर्षों का वार्षिक उत्पादन			
vi.	***Details of proposed works*** **प्रस्तावित कार्यों का विवरण**			
1.	***Year of establishment of present works*** वर्तमान फैक्टरी की स्थापना का वर्ष			
2.	***Year of commencement of manufacturing at above works*** उपरोक्त फैक्टरी में निर्माण कार्य शुरू होने का वर्ष			
3.	***Details of change in Works address in past (if any*** पूर्व में फैक्टरी स्थल में परिवर्तन का विवरण (यदि कोई हो)***)***			
4.	***Total Area*** कुल क्षेत्र			
	Covered Area शामिल क्षेत्र			
5.	***Factory Registration Certificate*** फैक्टरी पंजीकरण प्रमाण पत्र	***Details attached at Annexure – F2.1*** विवरण अनुलग्नक- एफ 2.1 पर संलग्न है		
6.	***Design/ Research & development set-up*** डिजाइन / अनुसंधान और विकास सेटअप ***(No. of manpower, their qualification, machines & tools employed etc.)*** (श्रमिकों की	***Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design)*** ***Details attached at Annexure – F2.2***		

	List of qualified NDT personnel with area of specialization विशेषज्ञता के क्षेत्र सहित पात्र एनडीटी कार्मिकों की सूची	***(if applicable)*** लागू / लागू नहीं
15.	***List of out-sourced manufacturing processes with Sub-Vendors' names & addresses*** सब-वेंडर द्वारा बाह्य स्रोतों (उनके नाम और पते सहित)से करवाएं गए निर्माण प्रक्रियाओं की सूची	***Applicable / Not applicable*** लागू / लागू नहीं ***Details attached at Annexure. –F2.11*** विवरण अनुलग्नक - F2.10में संलग्न है। ***(if applicable)*** (यदि लागू हो)
16.	***Supply reference list including recent supplies*** नवीनतम आपूर्ति सहित आपूर्ति संदर्भ सूची	***Details attached at Annexure – F2.12*** विवरण अनुलग्नक - F2.12 में संलग्न है। ***(as per format given below)*** (नीचे दिए गए प्रारूप के अनुसार)

Project/ package परियोजना /पैकेज	*Customer Name* ग्राहक का नाम	*Supplied Item (Type/Rating/Model /Capacity/Size etc)* आपूर्ति की गई वस्तु (प्रकार / रेटिंग / मॉडल / क्षमता / आकार आदि)	*PO ref no/date* पीओ संदर्भ सं. / तिथि	*Supplied Quantity* आपूर्ति की मात्रा	*Date of Supply* आपूर्ति की तारीख

17.	***Product satisfactory performance feedback letter/certificates/End User Feedback*** उत्पाद के संतोषजनक प्रदर्शन संबंधी फीडबैक पत्र / प्रमाण पत्र / अंतिम उपयोगकर्ता फ़ीडबैक	***Attached at annexure - F2.13*** अनुलग्नक F2. 3पर संलग्न है
18.	***Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product (similar or higher rating)*** प्रस्तावित उत्पाद (एक समान या उच्च रेटिंग वाले) के लिए टाइप टेस्ट रिपोर्ट (टाइप टेस्ट विवरण, रिपोर्ट संख्या, एजेंसी, जांच की तारीख) का सारांश नोट: - रिपोर्ट प्रस्तुत करने की आवश्यकता नहीं है ***Note:- Reports need not to be submitted***	***Applicable / Not applicable*** लागू / लागू नहीं ***Details attached at Annexure – F2.14*** विवरण अनुलग्नक - F2.14में संलग्न है ***(if applicable)*** (यदि लागू हो)
19.	***Statutory / mandatory certification for the proposed product*** प्रस्तावित उत्पाद के लिए वैधानिक / अनिवार्य प्रमाणीकरण	***Applicable / Not applicable*** लागू / लागू नहीं ***Details attached at Annexure – F2.15*** ***(if applicable)*** (यदि लागू हो)
20.	***Copy of ISO 9001 certificate*** आईएसओ 9001 प्रमाण पत्र की प्रति ***(if available***(यदि उपलब्ध हो)	***Attached at Annexure – F2.16*** अनुलग्नक में संलग्न - F2.1 6 है
21.	***Product technical catalogues for proposed item (if available)*** प्रस्तावित मद के लिए उत्पाद तकनीकी कैटलॉग (यदि उपलब्ध हो)	***Details attached at Annexure – F2.17*** विवरण अनुलग्नक - F2.1 7 में संलग्न है

एनटीपीसी NTPC	**CORPORATE QUALITY ASSURANCE/ कॉरपोरेट गुणवत्ता आश्वासन** **SUB-VENDOR QUESTIONNAIRE/ सब-वेंडर प्रश्नावली**

Name: ***नाम:***		***Desig:*** ***पदः***		***Sign:*** ***हस्ताक्षर:***		***Date:*** ***तिथि :***	

Company's Seal/Stamp:- ***कंपनी की मुहर / मोहर: -***