

ANNEXURE-I: BOQ CUM PRICE FORMAT												
NAME OF PROJECT:		2 X 660MW MAITREE SUPER THERMAL POWER PROJECT										
NAME OF PACKAGE:		ANUBAR (DELTA TYPE)										
TECHNICAL SPECIFICATION:		PE-TS-421-145-I918										
S. No.	DESCRIPTION	HSN / SAC CODE	UNIT	QTY	UNIT EX-WORKS PRICE (Duly packed including seaworthy packing) (INR) (6)	TOTAL EX-WORKS PRICE (Duly packed including seaworthy packing) (INR) (7) = [5X6]	FREIGHT CHARGES UPTO CHENNAI PORT OR CHA GODOWN AT CHENNAI PORT (8)		TOTAL PRICES (EX-WORKS + FREIGHT) (INR) (9) = [7+8B]	APPLICABLE GST RATE IN % OF (TOTAL EX WORKS + FREIGHT) BOTH (INR) (10)		TOTAL SUPPLY PRICE and SUPERVISION OF E&C (INR) (11) = [9+10B]
							FREIGHT IN % OF (TOTAL EX WORKS) (8A)	FREIGHT AMOUNT (INR) (8B) = [7X8A]		GST RATE IN % OF (TOTAL EX WORKS + FREIGHT) (10A)	GST AMOUNT (INR) (10B)= [9X10A]	
1.0	Complete ANUBAR Assembly including Purge Air System and Calibration (i.e. Fluid bar, Flanges, Spool piece, gaskets, fasteners, nuts, bolts, etc.) including accessories as per Annexure-1A of BOQ	9026	NOS.	2						0.1%		
2.0	START-UP/COMMISSIONING SPARES (2 SETS OF GASKET FOR EACH ANUBAR TAG MENTIONED IN S.L. NO. 1.0 OF ANNEXURE-I i.e. BOQ OF TECHNICAL SPECIFICATION)	9026	SET	2						0.1%		

TOTAL QUOTED AMOUNT IN WORDS:

PERCENTAGE OF TOTAL PRICE THAT WILL BE SOURCED FROM INDIA:-

Details of the location(s) at which the local value addition is made:-

POINTS FOR CONSIDERATION BEFORE FILLING ABOVE PRICE SCHEDULE-

- Prices Shall Be Firm Unless Otherwise Specifically Indicated In NIT .
- In case of discrepancy in GST rate corresponding to HSN code and quoted GST, the evaluation shall be done on quoted price and correct GST rate shall be considered for ordering (limited to quoted FOR Site price)
- Unless the context requires otherwise, in all tenders and tender related documents any reference to taxes such as ED, CST/VAT, Services. Tax etc. shall refer to GST as implemented by GOI w.e.f. 1.07.2017.
- CGST/SGST/UGST/IGST shall be paid at actuals against documentary evidence but restricted to the amount and percentage in the order/contract.
- In case, any GST credit is delayed/denied to BHEL due to non/delayed receipt of goods and/or tax invoice or expiry to timeline prescribed in the relevant Act for availing such ITC, or any other reasons not attributable to BHEL, tax amount shall be recoverable from the vendor/contractor along with interest levied/leviable on BHEL.
- All taxes and duties other than CGST/SGST/UGST/IGST shall be deemed to be included in the Ex-Works prices unless specified otherwise by the bidder in the price bid. No variation in other taxes and duties shall be payable by

ANNEXURE 1A: BOQ FOR SUPPLY ITEMS

NAME OF PROJECT:		2X660 MW BIFPCL MAITREE		
NAME OF PACKAGE:		ANUBAR (DELTA TYPE)		
TECHNICAL		PE-TS-421-145-I918		
S. No.	DESCRIPTION	HSN CODE	UNIT	QTY
1.0	COMPLETE ANUBAR ASSEMBLY including Purge Air System and CALIBRATION.			
1.1	Anubar (i.e. Fluid bar, Flanges, Spool piece, gaskets, fasteners, nuts, bolts, etc.)		Nos.	2
1.2	Adaptor (Swage lock Double Compression Type), DUPLEX SS32205, ½" SOC X ½" NPT (M)		Nos.	4
1.3	½" CPVC impulse pipe		Meter	4
1.4	TEE, CPVC 1/2" NPT (F)		Nos.	4
1.5	Ball type isolation valve, 1/2" SIZE, CPVC		Nos.	4
1.6	Adaptor CPVC, 1/2" NPT (M) x TO SUIT 1/2" SIZE CPVC at other end		Nos.	18
1.7	Ball isolation valve, 1/2" size, CPVC		Nos.	4
1.8	1/2" CPVC pipe		Meter	40
1.9	TEE, CPVC 1/2" NPT (F)		Nos.	2
1.10	Adaptor CPVC, 1/2" NPT (M) x to suit 1/2" size CPVC at other end		Nos.	2
1.11	Service air ball type isolation valve, CPVC ½"size		Nos.	2
2.0	START-UP/COMMISSIONING SPARES (2 SETS OF GASKET FOR EACH TAG)		SET	2
	Note:			
1	Bidder to note that bidder has to quote for all the items listed above in the main sheet of price format. For detail description of above items bidder to refer technical specification.			
2	Bidder to note that BHEL may ask for price breakup at any time during the tendering process and if bidder does not provide the same, then their bid is liable to get rejected.			



PRE-QUALIFICATION REQUIREMENTS

PE-PQ-421-145-I005

REVISION NO. 00 DATE 09.02.21

SHEET NO. 1 OF 1

PACKAGE: ANUBAR

1.0

- a. Bidder should be Original equipment manufacturer (OEM) for ANUBAR FLOW METER.
- b. In case 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.
 - 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 / Jointly bidding with their partner, then the credentials of collaborator / MOU Partner / licensing company / Principal company / JV partner / Bidding partner can also be considered for meeting PQR as per scope of the work. If bidder(s) qualifies on the basis of credentials of his principal/JV partner/Collaborator/joint bidder etc., then the principal/JV partner/Collaborator/MOU partner/Joint bidder shall be responsible for overall design vetting and warranty/guarantee of the package. The scope matrix indicating respective roles including design vetting, manufacturing of the critical component and warranty/guarantee, shall be furnished by bidder.

2.0

Supplier to submit following supporting documents for the product:

- a. Performance Certificate of the offered Anubar Flow Meter shall have at least 1 year of satisfactory operation as on or before 12th Jan-2021 in any industry. Performance 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.
- b. Format for Proven-ness Compliance Sheet enclosed in the specification which needs to be filled, signed & stamped by bidder.
- c. All necessary credential/performance certificate shall be submitted along with the bid. Proven ness criteria are a pre-condition for qualification of bid.

3.0

Bidder to submit all documents in English. If documents submitted by bidder are in language other than English, a self-attested English Translated document should also be submitted.

4.0

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.

5.0

Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidders/collaborators to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.

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2 X 660 MW MAITREES STPP, BANGLADESH

TECHNICAL SPECIFICATION FOR ANUBAR FLOWMETER

VOLUME-II-B

SPECIFICATION No: PE-TS-421-145-I918



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


MAITREE TPS, UNIT#1&2(2X660 MW)
**TECHNICAL SPECIFICATION
FOR ANUBAR (IMPACT HEAD TYPE)**

SPECIFICATION NO.: PE-TS-421-145-1918

VOLUME II B

SECTION C

REV. NO. 00

DATE: 03.02.2021

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MAITREE TPS, UNIT#1&2(2X660 MW)
**TECHNICAL SPECIFICATION
FOR ANUBAR (IMPACT HEAD TYPE)**

SPECIFICATION NO.: PE-TS-421-145-I918

VOLUME II B

SECTION A

REV. NO. 00

DATE: 03.02.2021

SECTION – A **SCOPE OF ENQUIRY**

	MAITREE TPS, UNIT#1&2(2X660 MW) TECHNICAL SPECIFICATION FOR ANUBAR (IMPACT HEAD TYPE)	SPECIFICATION NO.: PE-TS-421-145-I918	
		VOLUME	II B
		SECTION	A
		REV. NO.	00
		DATE: 03.02.2021	

SCOPE OF ENQUIRY

1.0 SCOPE

This specification covers the Design, Manufacture, Inspection and Testing at manufacturer's works, proper packing for transportation and delivery to site of the Anubar with accessories as mentioned in different sections of this specification for 2 x 660 MW MAITREE TPS, UNIT#1&2, Bangladesh.

- 1.2 The quality plan enclosed, forms the minimum requirement but not limited to be adhered to by the bidder.
- 1.3 Scope of supply shall be anubar, stub nipples, root valves, spares etc. 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). Datasheet A & B, duly filled
 - d) Provenness Certificate.

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 equipments shall not relieve the supplier of the responsibility of providing such facilities to complete the supply within the quoted prices.
- 2.3 BHEL's representative shall be given access to the shop in which the equipments are 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.

**MAITREE TPS, UNIT#1&2(2X660 MW)****TECHNICAL SPECIFICATION
FOR
ANUBAR (IMPACT HEAD TYPE)**

SPECIFICATION NO.: PE-TS-421-145-I918

VOLUME II B

SECTION C

REV. NO. 00

DATE: 03.02.2021

SPECIFIC TECHNICAL REQUIREMENTS


MAITREE TPS, UNIT#1&2(2X660 MW)
**TECHNICAL SPECIFICATION
FOR
ANUBAR (IMPACT HEAD TYPE)**
SPEC NO.: PE-TS-421-145-I918
VOLUME II B
SECTION C
REV. NO. 00
DATE : 03/02/2021
SPECIFIC TECHNICAL REQUIREMENTS

The technical requirements in this section are specific for this project and shall override the specification under Section-D in case of any contradiction.

- 1.0 Bidder to furnish necessary credentials & performance certificate for successful Operation in any industry with similar flow requirements. Further, Bidder to furnish filled format for proveness criteria, attached in the specification.
- 2.0 Bidder to note that duly filled up Data Sheet-B, Quality Plan, Format enclosed in Section-D of Volume IIB, to be signed and stamped and submitted with the bid.
- 3.0 The Datasheets shall be used by the Vendor- as inputs for applicable material for Anubar.
- 4.0 In case during erection/commissioning of the Anubar flow meter, any spares are required which have not been specified in the Start-up/commissioning spares list, the same will have to be supplied by the vendor without any implication.
- 5.0 Unless agreed otherwise, five (5) hard copies and three (3) sets of electronic copies of all documents are to be submitted in the English language. In addition, operation and maintenance manuals shall be translated into Bangla and provided as paper copies and in electronic format. 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)
- 6.0 Sea worthy Packing schedule & Painting schedule are part of this specification and same shall be followed.
- 7.0 Anubar Flow Meter shall comply with the relevant international standards such as DIN, BS. Chinese codes & standards are not acceptable.
- 8.0 In case of any discrepancy in Specific Technical Requirement and Equipment specification, Specific Technical Requirement shall prevail.

**MAITREE TPS, UNIT#1&2(2X660 MW)****TECHNICAL SPECIFICATION
FOR ANUBAR (IMPACT HEAD TYPE)**

SPECIFICATION NO.: PE-TS-421-145-I003

VOLUME II B

SECTION D

REV. NO. 00

DATE: 20.01.2021

SECTION – D

EQUIPMENT SPECIFICATION

	MAITREE TPS, UNIT#1&2(2X660 MW) TECHNICAL SPECIFICATION FOR ANUBAR (IMPACT HEAD TYPE)	SPECIFICATION NO.: PE-TS-421-145-I918	
		VOLUME	II B
		SECTION	D
		REV. NO.	00
		DATE: 03.02.2021	

1.0 SCOPE

This specification covers the Design, Manufacture, Inspection and Testing at the manufacturer's works, proper packing for transportation and delivery to site of Anubar for use in 2X660MW MAITREE TPS, UNIT# 1& 2 Bangladesh.

2.0 CODES AND STANDARDS

2.1 All the equipments specified herein shall comply with the requirements of the latest issue of the relevant National and International standards. Chinese codes & Chinese materials are not acceptable.

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

3.0 TECHNICAL REQUIREMENT

The anubar and the accessories shall be suitable for **sea water application** and continuous operation under an ambient temperature of 0-60°C and Relative Humidity of 5-100% unless specified otherwise in volume IIB Section-C or Section-D.

3.1 DP flow measurement

The flow devices producing a differential pressure signal, or DP having a high accuracy & reliability with rigid structure & shall be suitable for larger diameter pipe. The sensor comprises of a signal outer tube & an inner tube. The inner tube conveys the high-pressure signal & outer conveys the low press signal. The sensor can also be provided with dual averaging chambers with circular / pear shaped profile, which will convey the high pressure & low-pressure signal. This shall be suitable for online mounting.

3.2 Element / Probe

This shall be constructed of DUPLEX SS32205.

3.3 Assembly

Flow devices shall be complete with stub, flanged end, isolating valve with counter flanges, nipple, elbow, packing, etc. and shall be terminated with root valves for remote measurement. Each device shall also be provided with SS nameplate with tag number.

4.0 TEST & INSPECTION

4.1 The bidder shall adopt suitable quality assurance plan to ensure that the equipments offered will meet the specification requirements in full.

4.2 The stages where the purchaser would like to be associated for witnessing or verification would be indicated by the purchaser in the Quality plan before approval.

4.3 Quality Plan/Quality Assurance programme shall be submitted for owner approval. The following tests are to be included & test certificate/report shall be furnished.

1. Material Test Certificate
2. Hydro Test
3. Visual/Dimensional inspection report.

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

5.0 SPARES AND CONSUMABLES**5.1 Commissioning Spares and consumables**

As part of the main equipment supply, the bidder shall supply all commissioning spares and consumables required during Start-up,

5.2 Recommended Spares

	MAITREE TPS, UNIT#1&2(2X660 MW) TECHNICAL SPECIFICATION FOR ANUBAR (IMPACT HEAD TYPE)	SPECIFICATION NO.: PE-TS-421-145-I918	
		VOLUME II B	
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The bidder shall furnish a list of Recommended Spares along with the normal service expectancy period and frequency of replacement; quantities recommended for 3 years operation along with unit rate against each item to enable BHEL/BHEL's Customer to place a separate order later, if required.

5.3 Special Tools & Tackles

The bidder shall furnish a list of Special Tools & Tackles included in the bid.

6.0 DRAWINGS & DOCUMENTS

6.1 The offer shall include the following in 4 copies each.

- Technical data sheet for each flow measuring device assembly in the Pro forma enclosed under Data Sheet-B.
- Catalogue/Technical Literature.
- Assembly drawing with dimensional details.

6.2 4 copy each of the following along with 2 CDs to be furnished after award of contract for owner approval.

- Data Sheet, calculation, BOM/BOQ & GA drawings for Anubars.
- QAP for Anubars
- O&M Manual for Anubars

7.0 FOR INFORMATION

7.1 Storage and Commissioning Instruction

7.2 O&M are to be supplied as specified.

8.0 PACKING & MARKING

8.1 Sea worthy packing is applicable for this project. Each item shall be properly packed with adequate protection against friction, stresses, vibration & shock during transportation. Each packing box shall have marking as per Purchase Order.

8.2 Each assembly shall be identified with the following information.

- Tag No.
- Service.
- Line size & thickness.
- Direction of flow.

9.0 APPLICABLE DATA SHEETS

This document shall be read in conjunction with following data sheets.

- Data Sheet - A & B

	MAITREE TPS, UNIT#1&2(2X660 MW) TECHNICAL SPECIFICATION FOR ANUBAR (IMPACT HEAD TYPE)	SPECIFICATION NO.:PE-TS-421-145-I918	
		VOLUME	IIB
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DATA SHEETS A&B

	MAITREE TPS, UNIT#1&2(2X660 MW) TECHNICAL SPECIFICATION FOR ANUBAR (IMPACT HEAD TYPE)	SPECIFICATION NO.:PE-TS-421-145-I918	
		VOLUME	IIB
		SECTION	D
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		DATE : 03.02.2021	

Tag No. 01PAB11BP100/02PAB11BP100			
DATA SHEET – A & B			
DATA SHEET – A (TO BE FILLED BY PURCHASER)			DATA SHEET – B (TO BE FILLED UP BY BIDDER)
GENERAL	PROJECT	MAITREE TPS, UNIT#1&2(2X660 MW)	.....
	OFFER REFERENCE	Bidder to indicate	.....
	TAG NO. : QUANTITY	01PAB11BP100, 02PAB11BP100 |	.....|.....
	SERVICE	Total : 2 NOS.	.....
	MAKE : MODEL	CW HEADER	.....|.....
		Bidder to indicate	
ELEMENT	TYPE	IMPACT HEAD TYPE	.....
	PITOT ASSEMBLY	Bidder to indicate FLG SIZE & RATING	.....
	PROBE DIAMETER & SHAPE	Bidder to indicate	.....
	MATERIAL	DUPLEX SS32205	.....
	ACCURACY	± 1% OF ACTUAL VALUE	.....
	REPEATABILITY	± 0.1% OF ACTUAL VALUE	.....
	No. OF TAP	ONE	.....
PROCESS DATA	FLUID	SEA WATER	.....
	RATE OF FLOW (TPH)	NORMAL : 81340 TPH	.....
		DESIGN : 97610 TPH	.....
	UPSTREAM WORKING PRESS (Kg/cm2g)	2.7 Approx.	.....
	DESIGN PRESS (Kg/cm2g)	6.0	.....
	MAX. ALLOWABLE PRESS LOSS	0.005MWC at DESIGN FLOW	.....
	DIFF. PRESS AT MAX FLOW	Bidder to indicate	.....
	NORMAL TEMP (Deg C)	34	.....
MAXIMUM TEMP (Deg C)	60	.....	
PIPE LINE DATA	PIPE SIZE (OD x THK) mm	3336 x 18 mm	.....
	PIPE MATERIAL	CARBON STEEL AS PER SA134-A283 GRD/SA515 GR 60 WITH PU (POLYURETHANE) COATING INTERNALLY WITH MINIMUM 2 MM DFT AS PER AWWA-C- 222	.....
	AVAILABLE PIPE STRAIGHT LENGTH	UPSTREAM : 10 D DOWNSTREAM : 5 D	.....
	RESTRICTION	UPSTREAM : NIL DOWNSTREAM : NIL	.....
	LINE ORIENTATION	HORIZONTAL	.....
	PIPE LOCATION	UNDERGROUND (WITHIN PIT)	.....

	MAITREE TPS, UNIT#1&2(2X660 MW)		SPECIFICATION NO.:PE-TS-421-145-I918	
	TECHNICAL SPECIFICATION FOR ANUBAR (IMPACT HEAD TYPE)		VOLUME	IIB
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			DATE : 03.02.2021	

Tag No. 01PAB11BP100/02PAB11BP100 DATA SHEET – A & B				
DATA SHEET – A (TO BE FILLED BY PURCHASER)				DATA SHEET – B (TO BE FILLED UP BY BIDDER)
END CONNECTION	STUB / NIPPLE	SIZE : RATING : (Bidder to indicate) MATERIAL : DUPLEX SS32205		..... ..... .....
	SPOOL PIECE WITH FLANGE	SIZE : RATING : (Bidder to indicate) MATERIAL : DUPLEX SS32205		..... ..... .....
	ROOT VALVES	SIZE : 1/2" | RATING : Sch. 80 MATERIAL : CPVC (Industrial grade) (Refer GA drawing of Anubar)		..... ..... .....
		BIDDER TO SPECIFY IN HOLE SIZE TO BE DRILLED ON PROCESS PIPE FOR MOUNTING ANUBAR		
NAME SIGN DATE	PRPED BY	CHKD BY	APPD BY	COMPANY SEAL NAME SIGN DATE
NOTE : 1. INTERNAL BOTTOM SUPPORT OF DUPLEX SS32205 MATERIAL TO BE PROVIDED IN PROCESS PIPE SHALL BE PROVIDED BY BIDDER. 2. ALL WETTED PARTS SHALL BE DUPLEX SS32205. 3. FLUSHING ARRANGEMENT SHALL BE PROVIDED BY BIDDER. 4. SEA WORTHY PACKING IS APPLICABLE.				

**MAITREE TPS, UNIT#1&2(2X660 MW)****TECHNICAL SPECIFICATION
FOR ANUBAR (IMPACT HEAD TYPE)**

SPECIFICATION NO.: PE-TS-421-145-I918

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DATA SHEETS C

	MAITREE TPS, UNIT#1&2(2X660 MW)		SPECIFICATION NO.: PE-TS-421-145-I918	
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Tag No. 01PAB11BP100/02PAB11BP100

DATA SHEET – C

DATA SHEET – C FOR ANUBAR (DELTA TUBE)
(TO BE FILLED BY THE CONTRACTOR AFTER AWARD OF CONTRACT)

GENERAL	PROJECT TAG NO. : QUANTITY SERVICE MAKE : MODEL	
ELEMENT	TYPE PITOT ASSEMBLY PROBE DIAMETER & SHAPE MATERIAL ACCURACY REPEATABILITY No. OF TAP	
PROCESS DATA	FLUID RATE OF FLOW (T/HR) UPSTREAM WORKING PRESS (Kg/cm ² g) DESIGN PRESS (Kg/cm ² g) MAX. ALLOWABLE PRESS LOSS DIFF. PRESS AT MAX FLOW NORMAL TEMP (Deg C) MAXIMUM TEMP (Deg C)	
PIPE LINE DATA	PIPE SIZE (OD x THK) mm PIPE MATERIAL AVAILABLE PIPE STRAIGHT LENGTH RESTRICTION	

Tag No. 01PAB11BP100/02PAB11BP100

	MAITREE TPS, UNIT#1&2(2X660 MW)		SPECIFICATION NO.: PE-TS-421-145-I918	
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			REV. NO.	00
			DATE : 03.02.2021	

DATA SHEET – C

DATA SHEET – C FOR ANUBAR (DELTA TUBE)
(TO BE FILLED BY THE CONTRACTOR AFTER AWARD OF CONTRACT)

END CONNECTION	STUB / NIPPLE	SIZE : RATING :
	SPOOL PIECE WITH FLANGE	MATERIAL : SIZE : RATING : MATERIAL :
	ROOT VALVES	SIZE : | RATING : MATERIAL : END CONNECTION : | QTY. :
	BIDDER TO SPECIFY IN HOLE SIZE TO BE DRILLED ON PROCESS PIPE FOR MOUNTING ANUBAR	
NAME SIGN DATE	COMPANY SEAL	

**MAITREE TPS, UNIT#1&2(2X660 MW)****TECHNICAL SPECIFICATION
FOR ANUBAR (IMPACT HEAD TYPE)**

SPECIFICATION NO.: PE-TS-421-145-I918

VOLUME

SECTION-D

REV. NO. 00

DATE: 03.02.2021

BILL OF QUANTITY

	MAITREE TPS, UNIT#1&2(2X660 MW) TECHNICAL SPECIFICATION FOR ANUBAR (IMPACT HEAD TYPE)	SPECIFICATION NO.: PE-TS-421-145-I918		
		VOLUME		
		SECTION-D		
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BOQ OF ANUBAR

[1] COMPLETE ANUBAR ASSEMBLY including Purge Air System and CALIBRATION.

S. No.	ITEM DESCRIPTION	TOTAL QUANTITY	UNIT PRICE (Rs)	TOTAL PRICE (Rs)
1.1	Anubar (i.e. Fluid bar, Flanges, Spool piece, gaskets, fasteners, nuts, bolts, etc.)	2 nos.		
1.2	Adaptor (Swage lock Double Compression Type), DUPLEX SS32205, 1/2" SOC X 1/2" NPT (M)	4 nos.		
1.3	1/2" CPVC impulse pipe	4 meter		
1.4	TEE, CPVC 1/2" NPT (F)	4 nos.		
1.5	Ball type isolation valve, 1/2" SIZE, CPVC	4 nos.		
1.6	Adaptor CPVC, 1/2" NPT (M) x TO SUIT 1/2" SIZE CPVC at other end	18 nos.		
1.7	Ball isolation valve, 1/2" size, CPVC	4 nos.		
1.8	1/2" CPVC pipe	40 meter		
1.9	TEE, CPVC 1/2" NPT (F)	2 nos.		
1.10	Adaptor CPVC, 1/2" NPT (M) x to suit 1/2" size CPVC at other end	2 nos.		
1.11	Service air ball type isolation valve, CPVC 1/2"size	2 nos.		
[2]	START-UP/COMMISSIONING SPARES (2 SETS OF GASKET FOR EACH TAG)	2 sets		
TOTAL (Rs)				

Note:

- All accessories for installation/hook up for anubar is in bidder's scope.
- Wherever CPVC material is used, it must be of Industrial grade, ASTM D 1784, DIM F441, SOC A439 TYPE IV, Gr. 1-CLASS 23447B.

PARTICULARS OF THE BIDDER / AUTHORISED REPRESENTATIVE

NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL


MAITREE TPS, UNIT#1&2(2X660 MW)
**TECHNICAL SPECIFICATION
FOR ANUBAR (IMPACT HEAD TYPE)**

SPECIFICATION NO.: PE-TS-421-145-I918

VOLUME II B

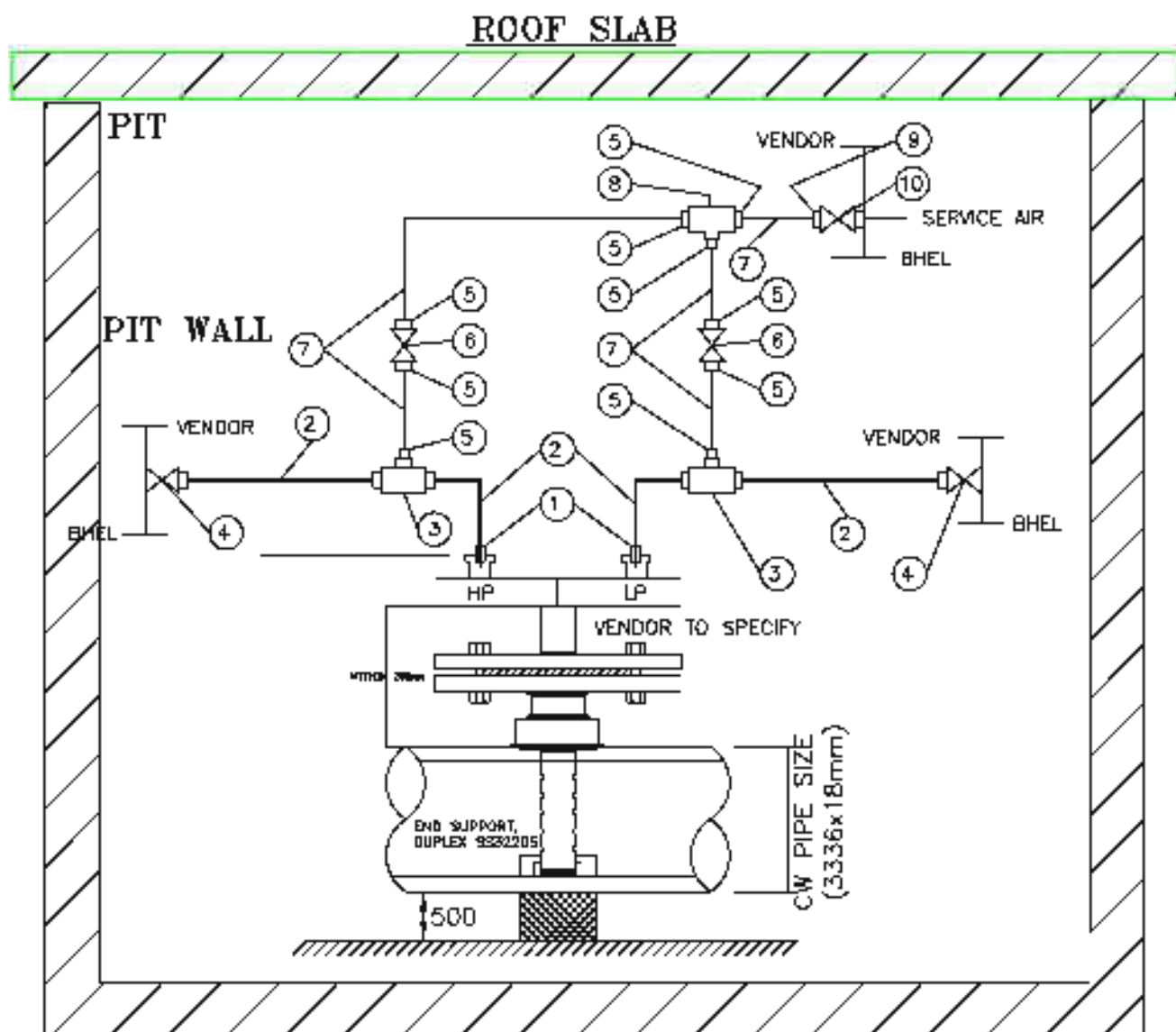
SECTION D

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ANUBAR GA DRAWING WITH PURGE AIR SYSTEM

FIGURE-2



NOTES:

1. Anubar location shall be in the pit as marked in this drawing.
2. Wherever CPVC material is used, it must be of (Industrial Grade) ASTM D 1784, DIM F441, SOC A439 TYPE IV, Gr. 1-CLASS 23447B
3. All accessories for installation/hook up for anubar is in bidder's scope.

ITEM NO.	ITEM DESCRIPTION	QTY.
1.	ADAPTOR (SWAGELock DOUBLE COMPRESSION TYPE), DUPLEX SS UN32205, 1/2" SOC x 1/2" NPT (M)	2 Nos.
2.	1/2 " CPVC IMPULSE PIPE	2 Meter
3.	TEE, CPVC 1/2" NPT (F)	2 Nos.
4.	BALL TYPE ISOLATION VALVE, 1/2" SIZE, CPVC	2 Nos.
5.	ADAPTOR CPVC, 1/2" NPT (M) x TO SUIT 1/2" SIZE CPVC AT OTHER END	9 Nos.
6.	BALL ISOLATION VALVE, 1/2" SIZE, CPVC	2 Nos.
7.	1/2" CPVC pipe	20 Meter
8.	TEE, CPVC 1/2" NPT (F)	1 No.
9.	ADAPTOR CPVC, 1/2" NPT (M) x TO SUIT 1/2" SIZE CPVC AT OTHER END	1 No.
10.	SERVICE AIR BALL TYPE ISOLATION VLV, CPVC 1/2" SIZE	1 No.

ANUBAR (IMPACT HEAD)
GENERAL ARRANGEMENT WITH PURGE AIR SYSTEM

**MAITREE TPS, UNIT#1&2(2X660 MW)****TECHNICAL SPECIFICATION
FOR ANUBAR (IMPACT HEAD TYPE)**

SPECIFICATION NO.: PE-TS-421-145-I918

VOLUME II B

SECTION D

REV. NO. 00

DATE: 03.02.2021

QUALITY PLAN

 PEM: C&I		QUALITY PLAN FOR ANUBAR MAITREE TPS, UNIT#1&2(2X660 MW)						QUALITY PLAN NO.: PE-QP-421-145-0044				
								VOLUME IIB				
								SECTION D				
								REV. NO. 00DATE: 03.02.2021				
								SHEET				
Sl. No.	Component / operation	Characteristics Checked	* Category	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency \$			Remarks
									M	C	N	
A1	RAW MATERIAL											
1	Sensor	Chemical Properties	MA	Lab Analysis	1/batch	ANSI-316	ANSI-316	Test Certificate	V	V	V	Relevant compliance certificate shall be verified by BHEL
2	Sensor Tube	Chemical Properties	MA	-do-	-do-	ANSI-316	ANSI-316	-do-	V	V	V	
3	Sensor Flange	Chemical Properties	MA	-do-	-do-	ANSI-316	ANSI-316	-do-	V	V	V	
4	Interpolating Tube	Chemical Properties	MA	-do-	-do-	ANSI-316	ANSI-316	-do-	V	V	V	
5	Mounting Hardware	Chemical Properties	MA	-do-	-do-	ANSI-316	ANSI-316	-do-	V	V	V	
B1	IN PROCESS INSPECTION											
1 to 5	Sensor, Sensor Tube, Interpolating	Dimensions	CR	Measurement	100%	Apprd drgs/ spec.	Apprd drgs/ spec.	Inspection Report	P	W	V	
6	Welding	Die Penetration Test	CR	Visual	100%	ASTM-E-165	ASTM-E-165	-do-	P	W	V	
7		Pressure Test	CR	Hydraulic Pressure Test	100%	Apprd drgs/ Spec.	Apprd drgs/ Spec.	-do-	P	W	V	

LEGEND:	* CR	- Critical characteristics	\$	P	- Agency Performing the Test.	M	- Manufacturer
	MA	- Major characteristics		W	- Agency Witnessing the Test.	C	- BHEL nominated Inspection agency
	MI	- Minor characteristics		V	- Agency Verifying the Test.	N	- CUSTOMER

 PEM: C&I		QUALITY PLAN FOR ANUBAR MAITREE TPS, UNIT#1&2(2X660 MW)						QUALITY PLAN NO.: PE-QP-421-145-0044				
								VOLUME IIB				
								SECTION D				
								REV. NO. 00DATE: 03.02.2021				
								SHEET				
Sl. No.	Component / operation	Characteristics Checked	* Cate gory	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency \$			Remarks
									M	C	N	
8	Finished Products	Dimensions	CR	Measurement	100%	Apprd drgs	Apprd drgs	Inspection Report	P	V	V	Sea worthy packing is applicable.
		Finish	CR	Visual	100%	Apprd drgs/ Spec.	Apprd drgs/ Spec.	-do-	P	V	V	
9	Packing	Soundness of Packing	MA	-do-	100%	BHEL Spec.	BHEL Spec.	Log Book	P	W	-	

LEGEND: *	CR	- Critical characteristics	\$	P	- Agency Performing the Test.	M	- Manufacturer
	MA	- Major characteristics		W	- Agency Witnessing the Test.	C	- BHEL nominated Inspection agency
	MI	- Minor characteristics		V	- Agency Verifying the Test.	N	- CUSTOMER

**MAITREE TPS, UNIT#1&2(2X660 MW)****TECHNICAL SPECIFICATION
FOR ANUBAR (IMPACT HEAD TYPE)**

SPECIFICATION NO.: PE-TS-421-145-I918

VOLUME II B

SECTION D

REV. NO. 00

DATE: 03.02.2021

PROVEN NESS CERTIFICATE



**MAITREE TPS, UNIT#1&2(2X660 MW)
TECHNICAL SPECIFICATION
FOR
ANUBAR (IMPACT HEAD TYPE)**

SPECIFICATION NO. | PE-TS-421-145-1918

VOLUME **IIB**

SECTION

REV. NO. 00

DATE:

Provenness Compliance Sheet

Name of Item/ Package:

Name of Vendor:

#	Name of Reference Project	Plant Rating	Years of Successful operation or before 12.01.2021	Certificate Attached	Remarks
1.					
2.					
3.					
4.					
5.					
6.					
7.					