(1) 2X800 MW USTPP, RAIGARH (PH-II), CHATTISGARH
(2) 2X800 MW USTPP, RAIPUR (PH-II),CHATTISGARH
(3) 2X800 MW USTPP, MIRZAPUR,UTTAR PRADESH
(4) 2X800 MW USTPP, KAWAI (PH-II),RAJASTHAN
(5) 2X800 MW USTPP, KORBA(PH-III),CHATTISGARH
(6) 2X800 MW USTPP, MAHAN(PH-III)SINGRAULI, MP

Customer: Adani Power
Consultant:TCE

TECHNICAL SPECIFICATION
FOR
PLATE HEAT EXCHANGER (PHE)

SPECIFICATION No.
PE-TS-513/515/516/522/523/524-179-W001
REV NO. 00

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

INDEX

BHEL	TECHNICAL SPECIFICATION PLATE HEAT EXCHANGER 2X800 MW ADANI RAIGARH-II, RAIPUR-II, MIRZAPUR, KAWAI-II, KORBA-III, MAHAN-III	PE-TS-513/515/516 /522/523/524-179-W001 Rev. No. 00 Date : 26.02.25

PROJECT INFORMATION

SL.NO	DESCRIPTION	RAIGARH-II	RAIPUR-II	MIRZAPUR	KAWAI-II	KORBA-III	MAHAN-III
1.0	**METEOROLOGICAL DATA**						
1.1	MAXIMUM TEMPERATURE	50 Deg C	49 Deg C	48.8 Deg C	48.5 Deg C	46 Deg C	48.8 Deg C
1.2	MINIMUM TEMPERATURE	9 Deg C	8 Deg C	12 Deg C	1.7 Deg C	13.9 Deg C	1 Deg C
1.3	MAXIMUM RELATIVE HUMIDITY	86%	82%	88%	90%	86%	85%
1.4	MINIMUM RELATIVE HUMIDITY	20%	35%	28%	18%	20%	20%
1.5	AVERAGE ANNUAL RAINFALL	1600 mm	1252 mm	1100 mm	761.4 mm	1300 mm	1132.7 mm
1.6	SEISMIC ZONE (AS PER IS 1893 - 2002)	Zone: II	Zone: II	Zone: III	Zone: II	Zone: III	Zone: IV
1.7	HEIGHT ABOVE MSL (Meter)	(+) 229.5	(+) 300	(+) 180.0	(+) 308.5	(+) 285	(+) 272.0
1.8	BASIC WIND SPEED (AS PER IS 875--Part III)	39 m/s	44 m/s	47 m/s	47 m/s	39 m/s	47 m/s
2.0	**ELECTRICAL DATA**						
2.1	AMBIENT TEMPERATURE FOR DESIGN OF ELECTRICAL EQUIPMENT	50 Deg C at relative humidity of 95%					
2.2	RATED FREQUENCY	50 Hz					
2.3	FREQUENCY VARIATION	(+)3 to (-)5 %					
2.4	AC VOLTAGE	415 V					
2.5	AC VOLTAGE VARIATION	+/-10 %					
2.6	FAULT LEVEL (KA/SEC)	50 KA for 1 second					

	TECHNICAL SPECIFICATION PLATE HEAT EXCHANGER 2X800 MW ADANI RAIGARH-II, RAIPUR-II, MIRZAPUR, KAWAI-II, KORBA-III, MAHAN-III	PE-TS-513/515/516 /522/523/524-179-W001 Rev. No. 00 Date : 26.02.25

GENERAL TECHNICAL REQUIREMENT

1	The design, manufacture and testing of the plate heat exchanger complete with all accessories, shall generally conform to the latest editions of the appropriate standards.
2	The equipment shall comply with all applicable safety codes and statutory regulations of India where the equipment is to be installed.
3	Unless otherwise necessary manufacturer's standard and proven models of the plate heat exchanger shall be supplied.
4	Latest codes and standards shall be applicable as on date of bid submission.
5	In the event of any conflict between the requirements of two clauses of this specification, documents or requirements of different codes and standards specified, stringent requirement as per the interpretation of the owner shall apply.
6	Bidder to note that drawing/document submission shall be through web based Document Management System. Bidder will be provided access to the DMS along with adequate training for drg/doc approval. Bidder to ensure proper net connectivity at their end.
7	The first submission/ revised submission of drawings/ documents by vendor shall be complete in all respects. Incomplete drawing submitted shall be treated as non- submission with delays attributable to vendor's account. For any clarification/ discussion required to complete the drawings, the bidder shall depute his personal to BHEL / Customer's place as per the requirement for across the table submissions/ discussions/ finalizations of drawings.
8	Drawing / documents to be submitted by bidder shall be as per "Documentation Requirement" given in this specification.
9	The details of the Plate Heat Exchangers with the quantity, design parameters, accessories etc. to be supplied shall be as per "TECHNICAL DATA, PART - A" enclosed in this specification.
10	Metallurgy specified in Technical Data Part-A is minimum. Equivalent or Superior materials suitable for fluid handled is also acceptable subject to Customer/BHEL approval.
11	Heat transfer plates shall be sealed at their outer edges and around the ports by gaskets in order to prevent leakage and inter-mixing of fluids.
12	Double sealing arrangement shall be provided at outer edge and around ports. The interspace between the seals shall be vented to atmosphere in order to avoid inter-mixing of liquids in case of gaskets failure.
13	The gasket arrangement shall be such that it receives continuous support to ensure a long gasket life. The gasket should be able to retain their properties and shape over a life period of 10 years.
14	For the purpose of calculating dirty overall heat transfer coefficient a total fouling factor as given in TECHNICAL DATA, PART - A shall be assumed. It is expected that the cleaning frequency shall be once in a year with the above fouling factor.
15	The upper carrying bar and lower guide bar shall be rigid in construction without any risk or sagging or buckling, and shall facilitate easy guiding of the plates.
16	All nozzles shall be flanged type and shall be as specified in TECHNICAL DATA, PART - A.

17	Velocity in the PHE plates shall be so chosen such that sufficient turbulence should be maintained so as to prevent any deposition on the plate surface.
18	Each plate shall be numbered in sequence. The number shall be marked by indelible ink on the plate to permit easy reassembly.
19	Equipment must be safe, reliable, and easy to maintain at all operating conditions.
20	It is mandatory for the bidder to submit along with the bid, the deviations if any – whether major or minor in the schedule of deviations only. In the absence of deviations listed in the “Schedule of deviations, the offer shall be deemed to be full conformity with the specification, “not-withstanding” anything else stated elsewhere in bidder’s offer. The implied/indirect deviations shall not be binding on the purchaser.
21	All sub vendors shall be subject to BHEL/CUSTOMER approval.

	TECHNICAL SPECIFICATION PLATE HEAT EXCHANGER 2X800 MW ADANI RAIGARH-II, RAIPUR-II, MIRZAPUR, KAWAI-II, KORBA-III, MAHAN-III	PE-TS-513/515/516 /522/523/524-179-W001 Rev. No. 00 Date : 26.02.25

TECHNICAL DATA, PART - A

SL.NO	DESCRIPTION	UOM	DETAIL
	PHE Designation		PHE (BTG & Station)
1.0	**Scope of Supply & Services**		
	The scope covers the design, manufacture, assembly, inspection and testing at manufacturer's and/or his sub-contractors works, proper packing for delivery of Plate Heat Exchangers along with mandatory spares complete with all accessories as per the requirements specified in this specification, PG Test at site and any other services, etc. if called for in the succeeding sections of the specification.		
1.1	Scope of supply of PHE Accessories and Spares in Bidder's Scope:		
1.1.1	Supporting arrangement complete with foundation plate channels, anchor bolts, nuts, sleeves, inserts etc.		
1.1.2	Matching piece (Reducer/Expander) if required to match to connecting pipe		
1.1.3	Matching counterflanges with gasket and fasteners for flanged connections		
1.1.4	Inspection ports with blind flange at the End plates of the PHE.		
1.1.5	Drain & vent connections for both side complete with isolation valves		
1.1.6	Lifting arrangement i.e., lifting lugs, eye bolts etc.		
1.1.7	Painting protection for all external and internal carbon steel surfaces		
1.1.8	One Ratchet spanner for each type of PHE		
1.2	Scope of Services:		
1.2.1	PG Test at site		
2.0	**DESIGN CODES & STANDARDS**		
2.1	Design Standard		IS/BS/DIN/ASTM/ASME
2.2	Thickness of pressure and frame plates, corrosion allowance etc.		As per ASME Sec-VIII, Div.1
2.3	Pipe Flanges and Flanged Fittings		ASME B 16.5
2.4	Structural steel		IS 2062
2.5	Threaded Steel Fasteners		IS 1367
2.6	Alloy-Steel and Stainless Steel Bolting		ASTM A193
2.7	Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts		ASTM A194
2.8	Stainless Steel Plate, Sheet, and Strip for Pressure Vessels		ASTM A240
2.9	Piping Fittings of Wrought Carbon Steel and Alloy Steel		ASTM A234
2.10	Carbon Steel Castings		ASTM A216
2.11	Carbon Steel Forgings		ASTM A105
2.12	Steel Bars, Carbon and Alloy, Hot-Wrought		ASTM A29
2.13	Stainless Chromium-Nickel Steel-Clad Plate		ASTM A264
2.14	Carbon Steel Plates		ASTM A283

	TECHNICAL SPECIFICATION PLATE HEAT EXCHANGER 2X800 MW ADANI RAIGARH-II, RAIPUR-II, MIRZAPUR, KAWAI-II, KORBA-III, MAHAN-III	PE-TS-513/515/516 /522/523/524-179-W001 Rev. No. 00 Date : 26.02.25

TECHNICAL DATA, PART - A

SL.NO	DESCRIPTION	UOM	DETAIL
3.0	**DESIGN /SYSTEM PARAMETERS**		
3.1	PHE Configuration		3X50% (2W+1S)
3.2	PHE Quantity for each 2x800 MW project	Nos.	6 (six) nos. for two units (3 nos per unit)
3.3	PHE Quantity (Total) for SIX (06) projects	Nos.	36 (THIRTYSIX) nos.
3.4	Primary side (Hot) Fluid		Passivated DM Water (pH around 9.5)
3.5	Secondary side (Cold) Fluid		Clarified Water
3.6	Design Pressure	kg/cm^2 (g)	10
3.7	Design Temperature	Deg. C	60
3.8	Operating Pressure (Primary side)	kg/cm^2 (g)	7.0-8.0
3.9	Operating Pressure (Secondary side)	kg/cm^2 (g)	2.5-3.0
3.10	Minimum HT plate thickness	mm	0.6
3.10	Negative tolerance allowed on HT plate thickness	%	Zero
3.11	Heat Transfer per Sq.Mtr. Of Heat Transfer Plate	Kcal/Hr./m^	Bidder to indicate
3.12	Specific Heat of Fluid - Primary side	Cal/gmDeg.	1.0
3.13	Specific Heat of Fluid - Secondary side	Cal/gmDeg.	1.0
3.14	Density of Fluid - Primary side	gm/cc	1.0
3.15	Density of Fluid - Secondary side	gm/cc	1.0
3.16	Overall fouling resistance (minimum) [Considering cleaning frequency once in a year]	Hr m2deg C/Kcal	0.00008
3.17	Minimum corrosion allowance on heat exchanger parts of carbon steel (e.g. pressure parts, nozzles, sliding channel and frame)	mm	1.6
4.0	**PERFORMANCE PARAMETERS**		
4.1	Design Flow Rate - Primary side	M^3/hr	1620
4.2	Design Flow Rate - Secondary side	M^3/hr	1940
4.3	Inlet temperature - Primary side	Deg. C	45.9
4.4	Inlet temperature - Secondary side	Deg. C	36
4.5	Outlet temperature (in fouled condition) - Primary side	Deg. C	38
4.6	Outlet temperature (in fouled condition) - Secondary side	Deg. C	42.6
4.7	Maximum allowable pressure loss at design flow in fouled conditions - Primary side	MWC	9
4.8	Maximum allowable pressure loss at design flow in fouled conditions - Secondary side	MWC	10

	TECHNICAL SPECIFICATION PLATE HEAT EXCHANGER 2X800 MW ADANI RAIGARH-II, RAIPUR-II, MIRZAPUR, KAWAI-II, KORBA-III, MAHAN-III	PE-TS-513/515/516 /522/523/524-179-W001 Rev. No. 00 Date : 26.02.25

TECHNICAL DATA, PART - A

SL.NO	DESCRIPTION	UOM	DETAIL
5.0	**CONSTRUCTION FEATURES**		
5.1	Location of PHE		Indoor
5.2	Connecting Pipe Size - Primary side (OD x THK)	NB mm	500 (508 x 6.0) CARBON STEEL
5.3	Connecting Pipe Size - Secondary side (OD x THK)	NB mm	600 (610 x 6.0) CARBON STEEL
5.4	Maximum permitted Length of the PHE (excluding reducer)	mm	5000
5.5	Additional HT plates on Design Plates	%	NIL
5.6	Extra Carrying capacity to be provided on frame assembly	%	25
5.7	Single Pass / Double Pass		Single Pass
5.8	Flow Pattern		Counter Flow
5.9	PHE backwash		No
6.0	**Material of Construction**		
6.1	Heat Transfer Plates		SS316
6.2	Plate Gasket		Nitrile rubber
6.3	Compression/Fixed/Frame/Movable Pressure plates		Carbon Steel, IS-2062 E250
6.4	Carrying Rails / bar		Carbon Steel, IS-2062, Gr.B, with SS Cladding
6.5	Guide Rails/ bar		Carbon Steel, IS-2062, Gr.B, with SS Cladding
6.6	Support Beam/ column		Carbon Steel, IS-2062 E250
6.7	Nozzle (Reducer/Expander) - Primary Side - Material		Carbon steel IS 2062, Gr. B
6.8	Nozzle (Reducer/Expander) - Secondary Side - Material		Carbon steel IS 2062, Gr. B
6.9	Nozzle flanges		Carbon Steel, IS-2062, E-250, Gr.B (Confirming to ANSI B 16.5 class, Min.-150 lb)
6.10	Nozzle flange bolts / nuts		SA 193 B7/ SA 194 2H
6.11	Nozzle flange gasket		3mm wire inserted Red Rubber
6.12	Flange/ Counter flanges		Carbon Steel, IS-2062, E-250, Gr.B (Confirming to ANSI B 16.5 class, Min.-150 lb)
6.13	Tightening Bolts/Rods & Nuts		IS-1367 Gr.8.8 or equivalent

	TECHNICAL SPECIFICATION PLATE HEAT EXCHANGER 2X800 MW ADANI RAIGARH-II, RAIPUR-II, MIRZAPUR, KAWAI-II, KORBA-III, MAHAN-III	PE-TS-513/515/516 /522/523/524-179-W001 Rev. No. 00 Date : 26.02.25

TECHNICAL DATA, PART - A

SL.NO	DESCRIPTION	UOM	DETAIL
6.14	Name Plate		SS 316 (min. 3 mm thick)
6.15	Wetted fasteners		SS-316
7.0	**INSPECTION/TESTING**		
7.1	Hydrotesting Pressure	kg/cm^2 (g)	1.5 times the design pressure
7.2	Duration of Hydrotesting	minutes	30

	TECHNICAL SPECIFICATION PLATE HEAT EXCHANGER 2X800 MW ADANI RAIGARH-II, RAIPUR-II, MIRZAPUR, KAWAI-II, KORBA-III, MAHAN-III	PE-TS-513/515/516 /522/523/524-179-W001 Rev. No. 00 Date : 26.02.25

TECHNICAL DATA - PART - B (SUPPLIER DATA TO BE FURNISHED AFTER AWARD OF CONTRACT)

SL.NO	DESCRIPTION	UOM	DETAIL
1.0	Manufacturer		
2.0	Model Number/ Type		
3.0	Heat Load		
a	Primary Side	Kcal/hr KW	
b	Secondary Side	Kcal/hr KW	
4.0	LMTD	DegC	
5.0	Total pressure drop across heat exchanger from inlet to outlet (including inlet & outlet nozzles) - at design flow		
a	Primary Side	MWC	
b	Secondary Side	MWC	
6.0	Total pressure drop across heat exchanger from inlet to outlet (including inlet & outlet nozzles) - at 110% of design flow	MWC	
a	Primary Side	MWC	
b	Secondary Side	MWC	
7.0	Film heat transfer co-efficient		
a	Primary Side	KCal/hrM^2 ^{o}C	
b	Secondary Side	KCal/hrM^2 ^{o}C	
8.0	Overall heat transfer coefficient - in clean condition	KCal/hrM^2 ^{o}C	
9.0	Overall heat transfer coefficient - in fouled condition	KCal/hrM^2 ^{o}C	
10.0	Total effective heat transfer area per heat exchanger	M^2	
11.0	Average Velocity through ports		
a	Primary Side	m/s	
b	Secondary Side	m/s	
12.0	Average Velocity through Plate Channels		
a	Primary Side	m/s	
b	Secondary Side	m/s	
13.0	Pressure drop in ports		
a	Primary Side	MWC	
b	Secondary Side	MWC	
14.0	Pressure drop in channels		
a	Primary Side	MWC	
b	Secondary Side	MWC	
15.0	Maximum operating differential pressure between hot and cold fluids in plate channels	kg/cm^2 (g)	
16.0	Area of each HT plate	M^2	
17.0	Dimension (width x height) of HT Plate	mm x mm	

	TECHNICAL SPECIFICATION PLATE HEAT EXCHANGER 2X800 MW ADANI RAIGARH-II, RAIPUR-II, MIRZAPUR, KAWAI-II, KORBA-III, MAHAN-III	PE-TS-513/515/516 /522/523/524-179-W001 Rev. No. 00 Date : 26.02.25

TECHNICAL DATA - PART - B (SUPPLIER DATA TO BE FURNISHED AFTER AWARD OF CONTRACT)

SL.NO	DESCRIPTION	UOM	DETAIL
18.0	Number of plates per heat exchanger	Nos.	
19.0	Maximum number of plates that can be accommodated in the heat exchanger frame	Nos.	
20.0	Type of corrugation in HT Plate		
21.0	Minimum plate pack length: i) As per 18.0 above ii) As per 19.0 above	mm	
22.0	Maximum plate pack length: i) As per 18.0 above ii) As per 19.0 above	mm	
23.0	Average spacing between two plates	mm	
24.0	Hold up volume of each passage	m^3	
25.0	Port size (diameter)		
a	Primary Side	mm	
b	Secondary Side	mm	
26.0	Plate Gasket Type		
27.0	Thickness of gasket	mm	
28.0	Hardness of gasket		
29.0	Nozzle flange class and drilling standard		
30.0	Overall Length of PHE		
a	Excluding Reducer/Expander	mm	
b	Inculding Reducer/Expander	mm	
31.0	Withdrawal Space / Maintenance Space required around each	mm	
32.0	Hydrotest Pressure	kg/cm2 (g)	

PERFORMANCE GUARANTEES TO BE DEMOSTRATED AT SITE

PG Testing at Site

1 The guaranteed performance parameters of the plate heat exchangers shall be proved by the supplier during the performance testing at site (as applicable).

2 Following to be demonstrated at site:

a Heat transfer coefficient determining the performance under design heat load and inlet & outlet temperatures of the plate type heat exchangers on the primary and secondary side.

b Pressure drop across the plate type heat exchanger on the primary and secondary water circuit.

3 Vendor to replace / take corrective action for any deficiency in performance parameters at site. If the site performance is found not meeting the requirements in any respect as specified, then the equipment shall be rectified or replaced by the vendor, without any price implication.

4 All duly calibrated instruments required for PG testing including for flow measurements (Ultra-sonic flow meter / similar type of instrument) shall be arranged by the bidder and taken back after the Test.

5 The computation of flow by characteristics curve of Pumps for PG Testing of PHE’s is not permitted.

6 At the time of performance testing, cleaning of the plates (if required) shall be arranged by the supplier.

	TECHNICAL SPECIFICATION PLATE HEAT EXCHANGER 2X800 MW ADANI RAIGARH-II, RAIPUR-II, MIRZAPUR, KAWAI-II, KORBA-III, MAHAN-III	PE-TS-513/515/516 /522/523/524-179-W001 Rev. No. 00 Date : 26.02.25	
SL. NO.	**DESCRIPTION**	**UOM**	**GUARANTEE VALUE**
	(To be Filled separately for each type of PHE)		
1.0	**PRIMARY SIDE (HOT WATER SIDE)**		
	FOULED CONDITION		
a)	Flow rate	M^3/Hr.	
b)	DMCW inlet temperature	^oC	
c)	DMCW outlet temperature	^oC	
d)	Pressure drop	MWC	
2.0	**SECONDARY SIDE (COLD WATER SIDE)**		
	FOULED CONDITION		
a)	Flow rate	M^3/Hr.	
b)	ACW inlet temperature	^oC	
c)	ACW outlet temperature	^oC	
d)	Pressure drop	MWC	

PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE

NAME

SIGNATURE

DATE

QUALITY PLAN

Quality Assurance and Quality Plan

1	Typical quality plan is enclosed in specification for guidance. The bidder shall comply with these minimum requirements and shall furnish his own quality plan for approval. The quality plan shall be subjected to customer's / purchaser's approval in the event of order without any cost implication.
2	Manufacturer shall conduct all tests and stage inspections as per the approved quality plan to ensure that the plate heat exchanger shall conform to the requirements of this specification and of the applicable codes/ standards.
3	All materials used for manufacture/ fabrication of the plate heat exchanger components shall be of tested quality.
4	Qualification of welding procedures and welders shall be as per ASME B&PV Code, Section-IX/applicable code.
5	During detailed engineering, the various shop test procedures for DP test, Hydro test, Light box test etc. shall be submitted by bidder along with the quality plan for BHEL/customer approval.
6	Plates cleaning agent, liquid penetrant and developer shall not contain any halogen.
7	Hydrotest shall be performed first by applying pressure at both sides of plate at the same time, then only to one side and finally only to other side. Fluorescent dye shall be used during the test for ease of leak detection.

STANDARD QUALITY PLAN

ITEM : Plate Heat Exchanger

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SL No.	COMPONENT/ OPERATION	CHARACTERISTICS	CATE-GORY OF CHECK	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		INSPECTION AGENCY			REMARKS
					M	C/A					M	C	A	
1	2	3	4	5	6		7	8	9	*D	**10			11
1.1	Plate/ Pipe/ Flange/ Bolts/ Fittings	Visual, Chemical & Mech. Property	Critical	Verify	1/Heat	1/Heat	Relevant Std/ Appd. Drg. ,Data Sheet	Relevant Std/ Appd. Drg. ,Data Sheet	TC/ IR	√	P	V	V	
		Dimension	Major	Measure	100%	100%/Random			TC/ IR	√	P	V	V	
		UT on plate thickness > 40mm	Major	Test	100%	100%/100%	ASTM A 435	ASTM A 435	TC/ IR	√	P	V	V	
1.2	Heat Transfer Plate (stainless steel)	Visual	Major	Surface check	100%	100%/100%	Appd. Drg. ,Data Sheet	Relevant Std /Appd Drg , Data Sheet	TC/ IR	√	P	V	V	
		Dimension	Major	Verify	100%	100%/Random			TC/ IR	√	P	V	V	
		Chemical & Mech. Property	Critical	Verify	1/Heat	1/Heat	Appd. Drg. ,Data Sheet	Relevant Std /Appd Drg , Data Sheet	TC	√	P	V	V	
1.3	Gaskets	Visual	Major	Surface check	100%	100%/100%	Appd. Drg. ,Data Sheet	Relevant Std /Appd Drg , Data Sheet	TC/ IR	√	P	V	V	
		Dimension	Major	Measure	100%	100%/Random	Appd. Drg. ,Data Sheet	Relevant Std /Appd Drg /Data Sheet	TC/ IR	√	P	V	V	
		Test certificate	Major	Verify	Random	Random	Appd. Drg. ,Data Sheet	Relevant Std /Appd Drg , Data Sheet	TC	√	P	V	V	
2.1	Welding Control	WPS, PQR	Major	Verify	100%	100%/100%	ASME Sec.IX	ASME Sec.IX	Records	√	P	V	V	
2.2	Marking/ Cutting/ Grinding for parts	Visual & Dimension	Major	Visual & Measure	100%	100%/-	Mfr.Drg	Mfr.Drg	IR /Log Book		P	V	-	

	STANDARD QUALITY PLAN												
adani	ITEM : Plate Heat Exchanger						SQP NO: ADANI/QA/SQP/M/041 Rev. No.: 00 Date: 01.07.2012 Page: 2 of 3				Approved By		
SL No.	COMPONENT/ OPERATION	CHARACTERISTICS	CATE-GORY OF CHECK	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		INSPECTION AGENCY			REMARKS
					M	C/A					M	C	A	
1	2	3	4	5	6		7	8	9	*D	**10			11
2.3	Fit up & Welding of Parts	Visual & Size	Major	Visual	100%	100%/-	Mfr.Drg	Mfr.Drg	IR /Log Book		P	V	-	
2.4	NDT	RT on Butt welds	Major	NDT	100%	100%/100%	ASME Sec.V	ASME Sec.VIII, Div.1,	RT Film	√	P	V	V	
2.5	Drilling/Machining of Parts	Visual & Dimension	Major	Visual & Measure	100%	100%/-	Mfr.Drg	Mfr.Drg	IR /Log Book		P	V	-	
2.6	Heat Transfer Plate (stainless steel)	Light Box Test	Major	Visual	100%	100%/10%	Appd Procedure	No Light indication	Test Report	√	P	H	H	
		DPT	Major	Test	10%	10%/10%	Appd Procedure	ASME Sec.VIII, Div.1,App-08	Test Report	√	P	V	V	
3	**Assembly**													
3.1	Laying of Gaskets in HT Plates	Size, Fitment & Finish	Major	Visual	100%	100%/-	Mfr.Drg	Mfr.Drg	IR /Log Book	√	P	V	-	
3.2	PHE Structure	Visual & Dimension	Major	Visual & Measure	100%	100%/100%	Appd. Drg, Data sheet/ Mfr std	Appd. Drg, Data sheet/ Mfr std	IR /Log Book	√	P	V	-	
		Surface Cleaning & Painting for CS Parts	Major	Visual & Measure	100%	100%/100%	Appd.Drg, Data sheet	Appd.Drg, Data sheet	IR	√	P	V	V	
3.3	Laying Of HT in PHE Structure	Size & NO of HT Plates	Major	Visual & Measure	100%	100%/100%	Appd.Drg, Data sheet	Appd.Drg, Data sheet	IR	√	P	V	V	
3.4	Tightening of Bolts	Size & Visual	Major	Visual	100%	100%/100%	Mfr.Drg	Mfr.Drg	IR /Log Book	√	P	V	-	
4	**Final Inspection**													

STANDARD QUALITY PLAN

ITEM : **Plate Heat Exchanger**

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SL No.	COMPONENT/ OPERATION	CHARACTERISTICS	CATE-GORY OF CHECK	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		INSPECTION AGENCY			REMARKS
					M	C/A					M	C	A	
1	2	3	4	5	6		7	8	9	*D	**10			11
4.1	Assembly	Visual & Dimension, No of HT Plate, Tightness of Bolts	Major	Visual & Measure	100%	100%/100%	Appd.Drg	Appd.Drg	IR	√	P	H	H	
4.2	Hydrostatic Test (Primary & Secondary side)	Test Pressure & Visual	Major	Visual	100%	100%/100%	Appd.Drg	No Leakage	IR	√	P	H	H	
4.3	Surface Preparation & Painting	Finish, Colour, Adhesion, Shade, DFT	Minor	Visual & Measure	Random	Random	Appd. Painting Schedule	Appd. Painting Schedule	IR	√	P	V	V	
4.4	Identification Marking	Marking	Minor	Visual	100%	100%/100%	Mfg. Std, Appd. Drg.	Mfg. Std, Appd. Drg.	IR	√	P	V	V	

Notes : 1.For UT these are not acceptable: (1) Cracks, flaps, seams, laps (2) Defect giving indication larger than from 2 mm diameter equivalent flaw (3) Group of defect with maximum indication less than that of from 2 mm diameter equivalent flaw which can not be separated at testing sensitivity if back echo is reduced to less than 70% (4) Defect giving indication of 1 to 2 mm diameter equivalent flow separated by a distance less than 4 times the size of larger of the adjacent flaw.

2. In case of difference in requirement specified in col. 7 & 8 of the QP from Appd. Drawing, Datasheet, the requirement mentioned in Appd. Drawing, Datasheet shall prevail.

LEGEND:- D* Records identified with tick (p) shall be essentially included by supplier & manufacturer in Quality Documentation package.

** M: Manufacturer / Sub-Supplier, C: Main Supplier , A: **ADANI** or their authorized representative.

Use the following term as appropriate in columns 10. **P**: Perform, **V**: verification and **H**: Customer Hold Point to be witnessed and work shall not proceed till it is witnessed and cleared in writing.

BHEL	TECHNICAL SPECIFICATION PLATE HEAT EXCHANGER 2X800 MW ADANI RAIGARH-II, RAIPUR-II, MIRZAPUR, KAWAI-II, KORBA-III, MAHAN-III	PE-TS-513/515/516 /522/523/524-179-W001 Rev. No. 00 Date : 26.02.25

PAINTING REQUIREMENT

1	Stainless Steel, Non- Ferrous and Galvanised item/portion will not be painted.
2	Painting on steel surfaces/parts shall be as per below table and all exposed External surface coating shall confirm to C-4 as per ISO 12944.

Sl no	Condition	Surface Preparation	Primer Coat	No. of Coats	DFT (Microns)	Intermediate Coat	No. of Coats	DFT (Microns)	Final Coat	No. of Coats	DFT (Microns)	Total DFT
1	Indoor/ Outdoor	S.A 2.5 of Swedish Specification no. SIS-05-5900-1967	inorganic ethyl self curing zinc silicate primer (coating)	1	75	High build epoxy MIO coating cured with polyamide hardener	1	100	High Build Gloss Aliphatic Acrylic Polyurethane	1	50	225

PACKING REQUIREMENT

Sl.no	DESCRIPTION
1	**Type of Packing:**
1.1	Item shall be fully covered with multi layered cross laminated colourless polyethylene sheet of at least 100 GSM and shall be packed inside wooden box or crate or fixed on wooden pallet depending upon the size.
1.2	Item shall be firmly fixed to the bottom of the packing box/crate/pallet with the help of supports/blocks to arrest the movement from all sides. The branch pipe ends and all opening shall be protected with polyethylene blind end caps.
1.3	Loose items/accessories like nipples, expander/reducer, root valves etc. shall be separately packed with polyethylene sheet of at least 100 GSM inside the packing box/crate.
2	**Quality of wood:**
2.1	**Quality of wood:** Wood used for packing box shall be Pinewood, Rubber wood, Mango wood, Fir wood, Silver Oak wood or other as per availability with moisture content not exceeding 30%.
3	**Cushioning material and moisture absorber:**
3.1	Suitable cushioning shall be provided by rubberized coir/ thermocol / expanded soft polyethylene foam.
3.2	Adequate quantity of packed desiccant shall be suitably placed inside the packing box.
4	**Packing slip & holder:**
4.1	Packing slip kept in polyethylene bag shall be placed inside the wooden box at appropriate
4.2	One copy of packing slip wrapped in polyethylene bag covered in galvanized iron tin sheet/ aluminium packing slip holder shall be fixed on the external surface the packing box.

	TECHNICAL SPECIFICATION PLATE HEAT EXCHANGER 2X800 MW ADANI RAIGARH-II, RAIPUR-II, MIRZAPUR, KAWAI-II, KORBA-III, MAHAN-III	PE-TS-513/515/516 /522/523/524-179-W001 Rev. No. 00 Date : 26.02.25

BILL OF QUANTITY

2X800 MW USTPP, RAIGARH-II, CHATTISGARH

SL NO	ITEM DESCRIPTION	UOM	TOTAL QTY.
1.0	**Main Supply:**		
1.1	PHE	Nos	6
2.0	**Mandatory Spares**	NOT APPLICABLE	
3.0	**Lumpsum Site Performance Testing of all PHE's.**	Nos	6

2X800 MW USTPP, RAIPUR-II,CHATTISGARH

SL NO	ITEM DESCRIPTION	UOM	TOTAL QTY.
1.0	**Main Supply:**		
1.1	PHE	Nos	6
2.0	**Mandatory Spares**	NOT APPLICABLE	
3.0	**Lumpsum Site Performance Testing of all PHE's.**	Nos	6

2X800 MW USTPP, MIRZAPUR, UTTAR PRADESH

SL NO	ITEM DESCRIPTION	UOM	TOTAL QTY.
1.0	**Main Supply:**		
1.1	PHE	Nos	6
2.0	**Mandatory Spares**	NOT APPLICABLE	
3.0	**Lumpsum Site Performance Testing of all PHE's.**	Nos	6

2X800 MW USTPP, KAWAI-II, RAJASTHAN

SL NO	ITEM DESCRIPTION	UOM	TOTAL QTY.
1.0	**Main Supply:**		
1.1	PHE	Nos	6
2.0	**Mandatory Spares**	NOT APPLICABLE	
3.0	**Lumpsum Site Performance Testing of all PHE's.**	Nos	6

2X800 MW USTPP, KORBA-III, CHATTISGARH			
SL NO	**ITEM DESCRIPTION**	**UOM**	**TOTAL QTY.**
1.0	**Main Supply:**		
1.1	PHE	Nos	6
2.0	**Mandatory Spares**	NOT APPLICABLE	
3.0	**Lumpsum Site Performance Testing of all PHE's.**	Nos	6

2X800 MW USTPP, MAHAN-III, SINGRAULI, MP			
SL NO	**ITEM DESCRIPTION**	**UOM**	**TOTAL QTY.**
1.0	**Main Supply:**		
1.1	PHE	Nos	6
2.0	**Mandatory Spares**	NOT APPLICABLE	
3.0	**Lumpsum Site Performance Testing of all PHE's.**	Nos	6

	TECHNICAL SPECIFICATION PLATE HEAT EXCHANGER 2X800 MW ADANI RAIGARH-II, RAIPUR-II, MIRZAPUR, KAWAI-II, KORBA-III, MAHAN-III	PE-TS-513/515/516 /522/523/524-179-W001 Rev. No. 00 Date : 26.02.25

DOCUMENTATION REQUIREMENT

Drawings & documents to be submitted by all the bidders along with the bid

Sl. No.	Document title
1	PQR credentials
2	Compliance sheet (duly signed & stamped)
3	Perforamce Gurantee schedule (duly signed & stamped)
4	Thermal sizing calculations (only for reference and shall be reviewed during detailed engineering).
5	GA drawing of PHE indicating all important details for layout purpose, withdrawal space required for plates, weight of assembly, nozzle & matching piece details etc. (only for reference and shall be reviewed during detailed engineering).

Drawings & documents to be submitted by successful bidder after award of contract along with submission schedule

Sl. No.	Document title	Submission schedule
1	Technical Datasheet & GA drawing - PHE	Within 15 days from LOI/PO
2	Thermal Sizing Calculation - PHE	Within 15 days from LOI/PO
3	QAP - PHE	Within 15 days from LOI/PO
4	Performance Curves - PHE	Within 15 days from LOI/PO
5	O & M Manual - PHE	Within 15 days from approval of above (Sl. No. 1 to 4) PHE documents.
6	PG Test Procedure - PHE	Within 15 days from approval of above (Sl. No. 1 to 4) PHE documents.
	BHEL/Customer comments/approval and Vendor Re-submission schedule	
1	BHEL comments on first submission	Within 10 days of Vendor submission.
2	BHEL/Customer comments/approval on revised	Within 18 days of Vendor submission.
3	Vendor Re-submission	Within 7 days of BHEL / Customer comments.

Performance curves and figures to be furnished during contact stage	
a)	Primary side water outlet temperature vs. Secondary side water inlet temperature.
b)	Primary side water flow (80% to 115%) vs. Pressure drop and outlet temperature (Secondary side flow – 100%)
c)	Secondary side water flow (80% to 115%) vs. Secondary side pressure drop and primary side outlet temp (Primary side flow – 100%)
d)	Primary side water outlet temperature vs. Primary side inlet temp.
e)	Film heat transfer coefficient curve
f)	Correction Curves.

Drawings & documents to be submitted as final/as-built document

Sl. No.	Document title
1	Approved documents
2	O&M Manual
3	All test certificates / reports
4	Drawings of components and details as deemed necessary.
5	Storage instructions

PRE QUALIFICATION REQUIREMENT (TECHNICAL)

	PRE-QUALIFYING REQUIREMENTS (TECHNICAL) - PLATE HEAT EXCHANGERS (PHE)	DOCUMENT NO: PE-TS-513/15/516/522/523/524-179-W001 REVISION NO: 03 DATE: 03/08/2021 SHEET: **1** of **3**

FORM NO. PEM 6100-0

ENQUIRY NO.:

PROJECT: 2X800 MW USTPP ADANI RAIPUR-II, RAIGARH-II, MIRZAPUR, KAWAI-II, KORBA-III, MAHAN-III

PACKAGE: PLATE HEAT EXCHANGER (PHE)

1. The bidder should have designed, manufactured, tested, inspected & supplied the PHE with minimum heat load of 3800400 Kcal/Hr, which have been successfully in use for at least 1 year in thermal power plant or similar industry/ application and bidder is in business of PHE on continuous basis.

2. Offers of the JV companies/ Joint Bidders/ bidders having collaboration / licensing agreement/ MOU/ Indian subsidiaries meeting the PQR at sl. no. 1 above shall be evaluated as follows:

   a. If bidder happens to be an Indian subsidiaries of foreign OEM, then the credentials of the foreign OEM can also be considered for meeting PQR.

   b. If bidder happens to be the Joint Venture Company, then the credentials of any of JV partners can be also considered for meeting PQR.

   c. If bidder happens to bid jointly with their partner, then credentials of both the partners will be considered for meeting PQR as per distribution of the work. In all such cases, lead bidder as specified in bid documents shall be responsible for overall execution of the contract and all guarantee/ warranty

   d. If bidder happens to be having valid collaboration agreement/ MOU/ licensing agreement with some other company, then the credentials of collaborator/ MOU partner/ licensing company can also be considered for meeting PQR.

Notes:

i) Bidder quoting on above route(s) should be manufacturer of PHE and qualifying on the basis of credentials of his principal/ JV partner/ Collaborator/ MOU partner/joint bidder/licensing Company etc., then the principal/ JV partner/ Collaborator/ MOU partner/ joint bidder/ licensing Company shall be responsible for overall design vetting and warranty/ guarantee of the package. The scope matrix clearly defining their respective roles including design vetting, manufacturing of critical component, E&C etc. and warranty/ guarantee shall be submitted along with the offer.

ii) Bidder to note that the arrangement of bidding (joint bid partners/ collaborator/ MOU partner/ licensing company etc.) once offered to BHEL as a part of bidding documents cannot be changed till the execution of the project.

3. The Bidders shall furnish following support documents for assessment of Bidder w.r.t. PQR as indicated at Sl. No. 1 above:

PREPARED BY:	**REVIEWED BY:**	**APPROVED BY:**
NAME: **DESIGNATION / DEPT.:**	**NAME:** **DESIGNATION / DEPT.:**	**NAME:** **DESIGNATION / DEPT.:**

A. Bidder's Experience list of PHE for last 5 years (as on the enquiry/NIT date) for assessment of bidder for supplying the PHE on regular basis for establishing business continuity in the enclosed format- Annexure-1.

Bidder shall furnish the PO copy of at least one executed Contract as indicated in the experience list.

B. Bidder shall furnish any one from below in support of successful performance of PHE for one year:

i. Satisfactory Performance feedback certificates from End Customer (Owner) (in English) for at least one successfully executed contract which has been in use for at least one year indicating salient features like year of commissioning of PHE, rating of project, flow & heat load of PHE, project name etc., date of issue of certificate and name/ designation of the certificate issuer for power plant/similar application industry. The time duration of satisfactory performance completion should be before the date of subject enquiry/NIT.

OR

ii. The bidder has been awarded one repeat contract for PHE from End Customer (Owner) / Purchaser (in English) for power plant/similar application industry. Repeat contract shall be considered when the second contract is given by the same purchaser/ owner after lapse of minimum 1 year from execution (viz. supply) of first contract. Supporting documents for execution of the first contract like dispatch[N2] details or commissioning report or PG test report along with the PO Copy to be furnished, if bidder intends to submit the documents for Repeat Contracts. The date of repeat contract order should not be later than the date of subject enquiry/NIT.

Notes:-

N1 - Purchase order copy, supporting drgs/technical data sheets etc. are to be submitted along with the bid for which the bidder intends to furnish the performance feedbacks / repeat contracts for reference purpose only.

N2 - Dispatch details shall include any one of the following documents:
a. Tax Invoice.
b. Site receipt/Receipted LR.
c. Customer's material dispatch clearance certificate.

N3 – Purchase order for spare items shall not be considered as repeat order qualifying criteria.

Any additional document required in support of above documents to establish the co-relation between the above documents and the supplied item shall be provided by the bidder.

	4. Bidder to submit all supporting documents in English. If documents submitted by bidder are in language other than English, a self-attested English translated document should also be submitted.
	5. Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidder/collaborators to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.
	6. After satisfactory fulfilment of all the above criteria/ requirement, offer shall be considered for further evaluation as per NIT and all the other terms of the tender.
	7. Consideration of offer shall be subject to customer's approval of bidders, if applicable.

EXPERIENCE LIST

ANNEXURE-1											
EXPERIENCE LIST											
PROJECT NAME	**END CUSTOMER**	**PHE PARAMETERS**			**HEAT TRANSFER AREA (sq.m.)**	**PHE MODEL NUMBER**	**No. OF PHE's SUPPLIED**	**TYPE OF FLUID**	**PLATE MATERIAL**	**YEAR OF SUPPLY**	**PERFORMANE FEEDBACK CERTIFICATE ENCLOSED (Y/N)**
		FLOW	**TEMP RISE**	**HEAT LOAD**							
		(Cu M/Hr.)	**(Deg. Cel.)**								

COMPLAINCE CERTIFICATE	
1	It is hereby confirmed that the complete technical specification has been read and understood. We confirm compliance to the tender specification including any prebid clarification and amendments issued prior to techno-commercial bid opening without any deviation.
2	It is hereby declared that any technical submittals which was not specifically asked by BHEL in NIT shall not to be considered as part of bid and shall not be evaluated by BHEL.

Signature of authorised Representative

Name and Designation :

Name & Address of the Bidder

Date

PRICE ADJUSTEMENT-PVC payment terms and conditions

The price adjustment provisions shall be applicable separately for price components relating to Supply of Equipment/Mandatory spare (as applicable), as per price break-up furnished by the Contractor in price schedule.

Price adjustment amounts towards aforesaid components of Contract Price shall be paid in the respective currencies of Contract(INR).

PVC payment shall be linked with Delivery period defined as per NIT terms & conditions. PVC shall be applicable only, during the extended period of contract (if any) after contractual completion period and for the portion of work delayed / backlog for the reasons not attributable to the Contractor.

The total amount of PVC payable shall not exceed 10 % of the BASIC contract value for respective order. Negative price variation (without any limit) shall be passed on to BHEL.

PRICE ADJUSTMENT FORMULA FOR SUPPLY AND MANDATORY SPARES –

The amount of price adjustment towards variable portion payable/recoverable on each shipment/despatch shall be computed as under:

EC = EC1 - EC0, EC1 will be computed as follows:

$EC1 = EC0 \{F + a \times A_1/ A_0 + Lb \times L_1/ L_0\}$

Where
EC = Adjustment to Ex-Works supply and mandatory spare Price Component expressed in the currency of The Contract (INR) payable to the contractor for each shipment/despatch.

EC1 = Adjusted Amount of Ex-Works supply and mandatory spare Price Component expressed in the currency of the Contract (INR) payable to the Contractor for each shipment/despatch.

EC0 = Ex-Works supply and mandatory spares Price expressed in the currency of the Contract (INR), shipment/despatch wise.

- "**F**" shall be fixed portion of the Ex-Works Component of the Contract and shall be considered as 0.15.

- "**a"** shall be co-efficient of major materials/items involved in the Ex-Works Component of the Contract Price and shall be considered as 0.6.

- 'A', shall be published price indices of corresponding major materials/items. For this purpose, indices available at Office of the Economic Advisor for Wholesale Price Index (WPI) of Stainless-Steel Coils, Strips & Sheets, (https://eaindustry.nic.in/)

- 'L' shall be per Other consumer price index number for industrial workers (All India Monthly Average) as published (https://rbi.org.in/Scripts/BS_ViewBulletin.aspx?Id=21024)

- 'Lb" shall be co-efficient for labour component in the Ex-Works Component of the Contract Price which shall be considered as 0.25.

Price Indices to be considered:

Material	Index	Base Year
Stainless-Steel Coils Strips & Sheets	WPI Index at Office of the Economic Advisor	2011-12
Industrial labour	Table No. 19, Sl. no.1 (RBI)	2016

For the indices, subscript '0' refers to indices of the month immediate after expiry of contractual delivery period.

Subscript '1' refers to indices as on month before actual delivery date/month of Shipment / despatch.

	CORPORATE QUALITY ASSURANCE SUB-VENDOR QUESTIONNAIRE

	Item/Scope of Sub-contracting	
i.	***Address of the registered office***	***Details of Contact Person (Name, Designation, Mobile, Email)***
ii.	***Name and Address of the proposed Sub-vendor's works where item is being manufactured***	***Details of Contact Person: (Name, Designation, Mobile, Email)***
iii.	***Annual Production Capacity for proposed item/scope of sub-contracting***	
iv.	***Annual production for last 3 years for proposed item/scope of sub-contracting***	
v.	***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***
10.	***Sources of Raw Material/Major Bought Out Item***	***Details attached at Annexure – F2.6***
11.	***Quality Control exercised during receipt of raw material/BOI, in-process , Final Testing, packing***	***Details attached at Annexure – F2.7***
12.	***Manufacturing facilities***	***Details attached at Annexure – F2.8***

CORPORATE QUALITY ASSURANCE
SUB-VENDOR QUESTIONNAIRE

	(List of machines, special process facilities, material handling etc.)	
13.	***Testing facilities*** ***(List of testing equipment)***	***Details attached at Annexure – F2.9***
14.	***If manufacturing process involves fabrication then-***	***Applicable / Not applicable***
	List of qualified Welders	***Details attached at Annexure – F2.10***
	List of qualified NDT personnel with area of specialization	***(if applicable)***
15.	***List of out-sourced manufacturing processes with Sub-Vendors' names & addresses***	***Applicable / Not applicable*** ***Details attached at Annexure. –F2.11*** ***(if applicable)***
16.	***Supply reference list including recent supplies***	***Details attached at Annexure – F2.12*** ***(as per format given below)***

Project/ package	*Customer Name*	*Supplied Item (Type/Rating/Model /Capacity/Size etc)*	*PO ref no/date*	*Supplied Quantity*	*Date of Supply*

17.	***Product satisfactory performance feedback letter/certificates/End User Feedback***	***Attached at annexure - F2.13***
18.	***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 – F2.14*** ***(if applicable)***
19.	***Statutory / mandatory certification for the proposed product***	***Applicable / Not applicable*** ***Details attached at Annexure – F2.15*** ***(if applicable)***
20.	***Copy of ISO 9001 certificate (if available)***	***Attached at Annexure – F2.16***
21.	***Product technical catalogues for proposed item (if available)***	***Details attached at Annexure – F2.17***

Name:		***Desig:***		***Sign:***		***Date:***	

Company's Seal/Stamp:-

2X800 MW USTPP, APL RAIPUR (PH-II),CHATTISGARH

PRICE SCHEDULE FOR PLATE HEAT EXCHANGER PACKAGE

SL. No.	DESCRIPTIONS OF WORKS OR EQUIPMENT	HSN CODE	UOM	TOTAL QTY.	UNIT EX-WORKS PRICE (DULY PACKED) (INR)	TOTAL EX-WORKS PRICE (DULY PACKED) (INR)	FREIGHT CHARGES @ % OF TOTAL EX-WORKS	TOTAL PRICES (EX-WORKS + FREIGHT) (INR)	APPLICABLE GST RATE @ % ON (TOTAL EX-WORKS + FREIGHT) (INR)	TYPE OF GST (IGST/CGST + SGST/UTGST)	TOTAL F.O.R. SITE PRICE (INR)
1	2		3	4	5	6=4*5	7	8	9		10=8+9
A	Total Price for Design, manufacture, assembly, inspection and testing, at manufacturer's and / or his sub contractor's works, properly packed and painted for transportation and delivery of Plate Heat Exchangers, complete with all accessories, special tools & tackles (if any), commissioning spares (if any), counter flanges with nuts, bolts, gaskets and coatings (wherever necessary), PG Testing as specified in the Technical specification No. PE-TS-513/515/516/522/523/524-179-W001 (Rev 00) .										
	Break up of 'A' above										
A.1	**PHE**		NOS.	6							
A.2	**Lumpsum Site Performance Testing of all PHE for FGD**	**SAC CODE**	**UOM**	**TOTAL QTY.**	**UNIT PRICE FOR PG TEST (INR)**	**TOTAL PRICE FOR PG TEST (INR)**	**FREIGHT CHARGES @ % OF TOTAL EX-WORKS**	**TOTAL PRICES (EX-WORKS + FREIGHT) (INR)**	**APPLICABLE GST @ % (INR)**	**TYPE OF GST (IGST/CGST + SGST/UTGST)**	**TOTAL PRICE FOR PG TEST WITH GST (INR)**
			SET	6							
B	**Grand Total (A.1+A.2)**										

NOTES :

1) Bidder to note that total price indicated above at B shall be considered complete in all respect for the full scope defined and considering all terms and conditions agreed.

2) Quantities indicated above shall be known as Order Quantities. The variation in Quantity shall be as per NIT.

3) Unit prices quoted by bidder, as above, shall be binding for any quantity variation.

4) Price of commissioning & erection spares, special tools & tackles and other accessories not listed above shall be included in the price of PHE & shall be supplied with the PHE.

5) Price break up for items not asked are deemed to be included in Sl.no '**A'** of this price schedule.

6) Delivery shall be as per NIT

7) Wherever quantity has been specified as percentage (%), it shall mean percentage (%) of the total population of the PHE for the project, unless specified otherwise and the fraction will be rounded off to the next higher whole number.

8) Wherever the quantities have been indicated for each type, size etc., these shall cover all the items to be supplied and installed.

9) PHE Accessories, E&C spares, special tools & tackles, (applicability as per specification) are part of PHE and to be supplied with PHEs.

2X800 MW USTPP, APL RAIGARH (PH-II), CHATTISGARH

PRICE SCHEDULE FOR PLATE HEAT EXCHANGER PACKAGE

SL. No.	DESCRIPTIONS OF WORKS OR EQUIPMENT	HSN CODE	UOM	TOTAL QTY.	UNIT EX-WORKS PRICE (DULY PACKED) (INR)	TOTAL EX-WORKS PRICE (DULY PACKED) (INR)	FREIGHT CHARGES @ % OF TOTAL EX-WORKS	TOTAL PRICES (EX-WORKS + FREIGHT) (INR)	APPLICABLE GST RATE @ % ON (TOTAL EX-WORKS + FREIGHT) (INR)	TYPE OF GST (IGST/CGST + SGST/UTGST)	TOTAL F.O.R. SITE PRICE (INR)
1	2		3	4	5	6=4*5	7	8	9		10=8+9
A	Total Price for Design, manufacture, assembly, inspection and testing, at manufacturer's and / or his sub contractor's works, properly packed and painted for transportation and delivery of Plate Heat Exchangers, complete with all accessories, special tools & tackles (if any), commissioning spares (if any), counter flanges with nuts, bolts, gaskets and coatings (wherever necessary), PG Testing as specified in the Technical specification No. PE-TS-513/515/516/522/523/524-179-W001 (Rev 00) .										
	Break up of 'A' above										
A.1	**PHE**		NOS.	6							
A.2	**Lumpsum Site Performance Testing of all PHE for FGD**	**SAC CODE**	**UOM**	**TOTAL QTY.**	**UNIT PRICE FOR PG TEST (INR)**	**TOTAL PRICE FOR PG TEST (INR)**	**FREIGHT CHARGES @ % OF TOTAL EX-WORKS**	**TOTAL PRICES (EX-WORKS + FREIGHT) (INR)**	**APPLICABLE GST @ % (INR)**	**TYPE OF GST (IGST/CGST + SGST/UTGST)**	**TOTAL PRICE FOR PG TEST WITH GST (INR)**
			SET	6							
B	**Grand Total (A.1+A.2)**										

NOTES :

1) Bidder to note that total price indicated above at B shall be considered complete in all respect for the full scope defined and considering all terms and conditions agreed.

2) Quantities indicated above shall be known as Order Quantities. The variation in Quantity shall be as per NIT.

3) Unit prices quoted by bidder, as above, shall be binding for any quantity variation.

4) Price of commissioning & erection spares, special tools & tackles and other accessories not listed above shall be included in the price of PHE & shall be supplied with the PHE.

5) Price break up for items not asked are deemed to be included in Sl.no '**A**' of this price schedule.

6) Delivery shall be as per NIT

7) Wherever quantity has been specified as percentage (%), it shall mean percentage (%) of the total population of the PHE for the project, unless specified otherwise and the fraction will be rounded off to the next higher whole number.

8) Wherever the quantities have been indicated for each type, size etc., these shall cover all the items to be supplied and installed.

9) PHE Accessories, E&C spares, special tools & tackles, (applicability as per specification) are part of PHE and to be supplied with PHEs.

2X800 MW USTPP, MTEUPPL MIRZAPUR (PH-I), UP

PRICE SCHEDULE FOR PLATE HEAT EXCHANGER PACKAGE

SL. No.	DESCRIPTIONS OF WORKS OR EQUIPMENT	HSN CODE	UOM	TOTAL QTY.	UNIT EX-WORKS PRICE (DULY PACKED) (INR)	TOTAL EX-WORKS PRICE (DULY PACKED) (INR)	FREIGHT CHARGES @ % OF TOTAL EX-WORKS	TOTAL PRICES (EX-WORKS + FREIGHT) (INR)	APPLICABLE GST RATE @ % ON (TOTAL EX-WORKS + FREIGHT) (INR)	TYPE OF GST (IGST/CGST + SGST/UTGST)	TOTAL F.O.R. SITE PRICE (INR)
1	2		3	4	5	6=4*5	7	8	9		10=8+9
A	Total Price for Design, manufacture, assembly, inspection and testing, at manufacturer's and / or his sub contractor's works, properly packed and painted for transportation and delivery of Plate Heat Exchangers, complete with all accessories, special tools & tackles (if any), commissioning spares (if any), counter flanges with nuts, bolts, gaskets and coatings (wherever necessary), PG Testing as specified in the Technical specification No. PE-TS-513/515/516/522/523/524-179-W001 (Rev 00) .										
	Break up of 'A' above										
A.1	**PHE**		NOS.	6							
A.2	**Lumpsum Site Performance Testing of all PHE for FGD**	**SAC CODE**	**UOM**	**TOTAL QTY.**	**UNIT PRICE FOR PG TEST (INR)**	**TOTAL PRICE FOR PG TEST (INR)**	**FREIGHT CHARGES @ % OF TOTAL EX-WORKS**	**TOTAL PRICES (EX-WORKS + FREIGHT) (INR)**	**APPLICABLE GST @ % (INR)**	**TYPE OF GST (IGST/CGST + SGST/UTGST)**	**TOTAL PRICE FOR PG TEST WITH GST (INR)**
			SET	6							
B	**Grand Total (A.1+A.2)**										

NOTES :

1) Bidder to note that total price indicated above at B shall be considered complete in all respect for the full scope defined and considering all terms and conditions agreed.

2) Quantities indicated above shall be known as Order Quantities. The variation in Quantity shall be as per NIT.

3) Unit prices quoted by bidder, as above, shall be binding for any quantity variation.

4) Price of commissioning & erection spares, special tools & tackles and other accessories not listed above shall be included in the price of PHE & shall be supplied with the PHE.

5) Price break up for items not asked are deemed to be included in Sl.no '**A**' of this price schedule.

6) Delivery shall be as per NIT

7) Wherever quantity has been specified as percentage (%), it shall mean percentage (%) of the total population of the PHE for the project, unless specified otherwise and the fraction will be rounded off to the next higher whole number.

8) Wherever the quantities have been indicated for each type, size etc., these shall cover all the items to be supplied and installed.

9) PHE Accessories, E&C spares, special tools & tackles, (applicability as per specification) are part of PHE and to be supplied with PHEs.

2X800 MW USTPP, APL MAHAN (PH-III), UP

PRICE SCHEDULE FOR PLATE HEAT EXCHANGER PACKAGE

SL. No.	DESCRIPTIONS OF WORKS OR EQUIPMENT	HSN CODE	UOM	TOTAL QTY.	UNIT EX-WORKS PRICE (DULY PACKED) (INR)	TOTAL EX-WORKS PRICE (DULY PACKED) (INR)	FREIGHT CHARGES @ % OF TOTAL EX-WORKS	TOTAL PRICES (EX-WORKS + FREIGHT) (INR)	APPLICABLE GST RATE @ % ON (TOTAL EX-WORKS + FREIGHT) (INR)	TYPE OF GST (IGST/CGST + SGST/UTGST)	TOTAL F.O.R. SITE PRICE (INR)
1	2		3	4	5	6=4*5	7	8	9		10=8+9
A	Total Price for Design, manufacture, assembly, inspection and testing, at manufacturer's and / or his sub contractor's works, properly packed and painted for transportation and delivery of Plate Heat Exchangers, complete with all accessories, special tools & tackles (if any), commissioning spares (if any), counter flanges with nuts, bolts, gaskets and coatings (wherever necessary), PG Testing as specified in the Technical specification No. PE-TS-513/515/516/522/523/524-179-W001										
	Break up of 'A' above										
A.1	**PHE**		NOS.	6							
A.2	**Lumpsum Site Performance Testing of all PHE for FGD**	**SAC CODE**	**UOM**	**TOTAL QTY.**	**UNIT PRICE FOR PG TEST (INR)**	**TOTAL PRICE FOR PG TEST (INR)**	**FREIGHT CHARGES @ % OF TOTAL EX-WORKS**	**TOTAL PRICES (EX-WORKS + FREIGHT) (INR)**	**APPLICABLE GST @ % (INR)**	**TYPE OF GST (IGST/CGST + SGST/UTGST)**	**TOTAL PRICE FOR PG TEST WITH GST (INR)**
			SET	6							
B	**Grand Total (A.1+A.2)**										

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8) Wherever the quantities have been indicated for each type, size etc., these shall cover all the items to be supplied and installed.

9) PHE Accessories, E&C spares, special tools & tackles, (applicability as per specification) are part of PHE and to be supplied with PHEs.

2X800 MW USTPP, APL KORBA (PH-III), UP

PRICE SCHEDULE FOR PLATE HEAT EXCHANGER PACKAGE

SL. No.	DESCRIPTIONS OF WORKS OR EQUIPMENT	HSN CODE	UOM	TOTAL QTY.	UNIT EX-WORKS PRICE (DULY PACKED) (INR)	TOTAL EX-WORKS PRICE (DULY PACKED) (INR)	FREIGHT CHARGES @ % OF TOTAL EX-WORKS	TOTAL PRICES (EX-WORKS + FREIGHT) (INR)	APPLICABLE GST RATE @ % ON (TOTAL EX-WORKS + FREIGHT) (INR)	TYPE OF GST (IGST/CGST + SGST/UTGST)	TOTAL F.O.R. SITE PRICE (INR)
1	2		3	4	5	6=4*5	7	8	9		10=8+9
A	Total Price for Design, manufacture, assembly, inspection and testing, at manufacturer's and / or his sub contractor's works, properly packed and painted for transportation and delivery of Plate Heat Exchangers, complete with all accessories, special tools & tackles (if any), commissioning spares (if any), counter flanges with nuts, bolts, gaskets and coatings (wherever necessary), PG Testing as specified in the Technical specification No. PE-TS-513/515/516/522/523/524-179-W001 (Rev 00) .										
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A.1	**PHE**		NOS.	6							
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8) Wherever the quantities have been indicated for each type, size etc., these shall cover all the items to be supplied and installed.

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2X800 MW USTPP, APL KAWAI (PH-II), UP

PRICE SCHEDULE FOR PLATE HEAT EXCHANGER PACKAGE

SL. No.	DESCRIPTIONS OF WORKS OR EQUIPMENT	HSN CODE	UOM	TOTAL QTY.	UNIT EX-WORKS PRICE (DULY PACKED) (INR)	TOTAL EX-WORKS PRICE (DULY PACKED) (INR)	FREIGHT CHARGES @ % OF TOTAL EX-WORKS	TOTAL PRICES (EX-WORKS + FREIGHT) (INR)	APPLICABLE GST RATE @ % ON (TOTAL EX-WORKS + FREIGHT) (INR)	TYPE OF GST (IGST/CGST + SGST/UTGST)	TOTAL F.O.R. SITE PRICE (INR)
1	2		3	4	5	6=4*5	7	8	9		10=8+9
A	Total Price for Design, manufacture, assembly, inspection and testing, at manufacturer's and / or his sub contractor's works, properly packed and painted for transportation and delivery of Plate Heat Exchangers, complete with all accessories, special tools & tackles (if any), commissioning spares (if any), counter flanges with nuts, bolts, gaskets and coatings (wherever necessary), PG Testing as specified in the Technical specification No. PE-TS-513/515/516/522/523/524-179-W001 (Rev 00) .										
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A.1	**PHE**		NOS.	6							
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B	**Grand Total (A.1+A.2)**										

NOTES :

1) Bidder to note that total price indicated above at B shall be considered complete in all respect for the full scope defined and considering all terms and conditions agreed.

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8) Wherever the quantities have been indicated for each type, size etc., these shall cover all the items to be supplied and installed.

9) PHE Accessories, E&C spares, special tools & tackles, (applicability as per specification) are part of PHE and to be supplied with PHEs.

	PRE - QUALIFYING REQUIREMENTS
PROJECT:	**2X800 MW ADANI RAIGARH TPP PHASE-II,2 X 800 MW ADANI POWER RAIPUR TPP - BTG,2 X 800 MW MTEUPPL MIRZAPUR PHASE I BTG,2 X 800 MW ADANI KAWAI TPP PHASE-II - BTG,2 X 800 MW KPL KORBA TPP PHASE-III - BTG,2 X 800 MW ADANI MAHAN TPP PHASE-III - BTG**
PACKAGE:	**HEAT EXCHANGERS(PLATE TYPE)**

CRITERIA FOR EVALUATION - FINANCIAL :

	Amount (in Rs.)
Average annual financial turnover value during any three out of last six Financial Years as on tender due date should not be less than	**3,02,00,000.00**

Rs.Three Crore Two Lakh only

Notes:-

a) The bidder has to submit financial accounts (audited, if applicable comprising of Audit report, Balance Sheet, Profit & Loss A/c Statement and Notes/Schedules pertaining to Turnover/Sales/Revenue), for any three out of last six Financial Years (or from the date of incorporation, whichever is less) as on tender due date to review the above criteria. In case the incorporation of vendor is less than 3 years, average annual financial turnover shall be calculated based on available information as below:-

i) If the accounts are available for <= 1 Financial Year, the Average Annual Turnover shall be calculated based on available information divided by 1 (One).

ii) If the accounts are available for >1 but < = 2 Financial Years, the Average Annual Turnover shall be calculated based on available information divided by 2 (Two).

iii) If the accounts are available for >2 but <= 3 Financial Years, the Average Annual Turnover shall be calculated based on available information divided by 3 (Three).

b) Foreign bidder is to submit a latest report from reputed third party business rating agency like Dun & Bradstreet, Credit reform etc. in addition to the documents mentioned at point (a) above for review of above criteria.

c) Other Income shall not be considered for arriving at Annual Turnover/Sales.For evaluation purpose,turnover figure excluding taxes shall be considered.

d) For evaluation of foreign bidder, exchange rate (TT selling rate of SBI) as on scheduled date of tender opening (Part-I bid in case of two part bid) shall be considered.

e)Bidder who is 50% or above subsidiary of any other company including those registered outside India and does not meet any of the above Financial Criteria, such bidder may be qualified based on credentials of its holding company provided such holding company meets the above PQR criteria. In such case, the Bidder would be required to furnish a Letter of Support from its Holding Company, pledging unconditional and irrevocable financial support for the execution of the Contract by the Bidder in case of award.

f)In cases where audited results for the last financial year as on the date of Techno Commercial bid opening are not available, a Certificate would be required from CEO/CFO stating that the financial results of the Company are under audit as on the date of Techno-commercial bid opening and are not available.