	TECHNICAL SPECIFICATION LOW PRESSURE AIR DISTRIBUTION SYSTEM	SPECIFICATION NO.PES-553-07	
		VOLUME II B	
		SECTION D	
		REV. 02	DATE: 17.09.2012
		SHEET 7 OF 8	

6.

BALANCING

6.1.1

The entire air distribution system shall be balanced by vendor to supply the air quantities as required in various rooms so as to maintain the requisite temperature and air flow in the conditioned spaces. The final balance of air quantities through each grill/diffuser etc. shall be recorded and submitted to purchaser for approval. Proper steps shall be taken to have a uniform temperature in all enclosures, with utmost care for noise level to be within tolerance limit

6.1.2

All instruments required for testing/balancing etc. of the air distribution system shall be provided by vendor.


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TECHNICAL SPECIFICATION
LOW PRESSURE AIR DISTRIBUTION
SYSTEM

SPECIFICATION NO.PES-553-07

VOLUME II B

SECTION D

REV. 02

DATE: 17.09.2012

SHEET 8 OF 8

7. DATA TO BE FURNISHED BY VENDOR AFTER THE AWARD OF CONTRACT

- 7.1 Fabrication drawings of ducts and grilles, louvers, dampers, etc, including typical details of grilles dampers etc.
- 7.2 Test certificates in line with scope of inspection.
- 7.3 Other dimensional drawings & documents as may be required by purchaser for better understanding of the system & for preparation of operation, maintenance & instruction manual.


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TECHNICAL SPECIFICATION
2X500 MW NEW NEYVELI

SPECIFICATION No: PE-TS-400 & 402-553-A001

VOLUME II B

SECTION E

REV. 00

DATE: NOV 2014

SECTION: E
INSPECTION AND TESTING


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TITLE

**AIR-CONDITIONING SYSTEM
INSPECTION AND TESTING**

SPECIFICATION NO. PE-TS-400 & 402-553-A001

VOLUME

SECTION - E

REV 00

DATE: NOV 2014

1.00.00 INSPECTION AND TESTING

1.01.00 Inspection and Tests during Manufacture.

1.01.01 The method and techniques to be used by the Bidder for the control of quality during manufacture of all plant and equipment shall be agreed with the Owner.

1.01.02 The Owner's general requirements with respect to quality control and the required shop tests are set out elsewhere in this specification.

1.01.03 Before any item of plant or equipment leaves its place of manufacture the Owner shall be given the option of witnessing inspections and tests for compliance with the specification and related standards.

1.01.04 Advance notice shall be given to the Owner as agreed in the Contract, prior to the stage of manufacture being reached, and the piece of plant must be held at this stage until the Owner has inspected the piece, or has advised in writing that inspection is waived. If having consulted the Owner and given reasonable notice in writing of the date on which the piece of plant will be available for inspection, the Owner does not attend the Bidder may proceed with manufacture having forwarded to the Owner duly certified copies of his own inspection and test results.

The owner's representative shall have at all reasonable times access to bidder's or his sub-vendor's premises and shall have power to inspect/ examine materials and workmanship or equipment under manufacture.

The Bidder shall forthwith forward to the engineer duly certified copies of the Test Certificates in six copies (one to the Purchaser and five to the Consulting Engineer) for approval. Further nine (9) copies of Shop Test Certificates shall be bound with Instruction Manuals referred to elsewhere.

For electrical equipment, routine tests as per relevant IS spec are to be carried out on all equipment. Type tests are also to be carried out on selected equipment as detailed in the specs of concerned electrical equipment.

1.01.05 Under no circumstances any repair or welding of castings be carried out without the consent of the Engineer. Proof of the effectiveness of each repair by radiographic and/or other non-destructive testing technique, shall be provided to the Engineer.

1.01.06 All the individual and assembled rotating parts shall be statically and dynamically balanced in the works.
Where accurate alignment is necessary for component parts of machinery normally assembled on site, the Bidder shall allow for trial assembly prior to despatch from place of manufacture.

1.01.07 All materials used for the manufacture of equipment covered under this specification shall be of tested quality. Relevant test certificates shall be made available to the Purchaser. The certificates shall include tests for mechanical properties and chemical analysis of representative material. Equipment or parts coming under any statutory Regulations shall be certified by a Competent Authority under the regulations in the specified format.

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TITLE

**AIR-CONDITIONING SYSTEM
INSPECTION AND TESTING**

SPECIFICATION NO. PE-TS-400 & 402-553-A001

VOLUME

SECTION - E

REV 00

DATE: NOV 2014

1.01.08 All pressure parts connected to pumping main shall be subjected to hydraulic testing at a pressure of 150% of shut-off head for a period not less than one hour. Other parts shall be tested for one and half times the maximum operating pressure, for a period not less than one hour.

1.01.09 All necessary non-destructive examinations shall be performed to meet the applicable code requirements.

1.01.10 All welding procedures adopted for performing welding work shall be qualified in accordance with the requirements of Section-IX of ASME code or IBR as applicable. All welded joints for pressure parts shall be tested by liquid penetrant examination according to the method outlined in ASME Boiler and Pressure Vessel code. Radiography, magnetic particle examination magnuflux and ultrasonic testing shall be employed wherever necessary/ recommended by the applicable code. At least 10% of all major but welding joints shall be radiographed unless otherwise stipulated.

Statutory payments in respect of IBR approvals including inspection shall be made by the bidder. Bidder's scope shall include to preparation of all necessary documents, co-ordination and follow-up for above approval. Owner shall only forward assistance/endorsement of documents /design /drawings /reports/records to be submitted for approval as stipulated/ required by Statutory Authorities till registration of the unit and clearance for commercial operation.

1.02.00 Performance Tests at Site

1.02.01 The full requirements for testing the system shall be agreed between the Owner and the Bidder prior to Award of Contract. The completely erected System shall be tested by the Bidder on site under normal operating conditions. The Bidder shall also ensure the correct performance of the System under abnormal conditions, i.e. the correct working of the various emergency and safety devices, interlocks, etc.

1.02.02 The Bidder shall provide complete details of his normal procedures for testing, for the quality of erection and for the performance of the erected plant. These tests shall include site pressure test on all erected pipe work to demonstrate the quality of the piping and the adequacy of joints made at site.

1.02.03 The Bidder shall furnish the quality procedures to be adopted for assuring quality from the receipt of material at site, during storage, erection, pre-commissioning to tests on completion and commissioning of the complete system/equipment.

1.03.00 For details of specific tests required on individual equipment refer to respective section of this specification.

All Statutory testing / clearance is in Bidder's scope including payment of all fees, etc. as required


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TECHNICAL SPECIFICATION
2X500 MW NEW NEYVELI

SPECIFICATION No: PE-TS-400 & 402-553-A001

VOLUME III

REV. 00

DATE: AUGUST 2014

VOLUME III


Praveen Kothari

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**VENTILATION SYSTEM
2X500 MW NEW NEYVELI**

SPECIFICATION NO. PE-TS-400 & 402-554-A001

VOLUME III

SECTION

REV 00

DATE: NOV 2014

SHEET 1 OF 1

BIDDER SHOULD SUBMIT THE SIGNED AND STAMPED COPY OF THE FOLLOWING DOCUMENTS ALONG WITH THE BID:

1. Compliance cum confirmation certificate
2. Guaranteed power consumption
3. Schedule of technical deviation, if any (Deviation sheet part B)
4. Un priced format for main package
5. Un priced format for mandatory spare
6. Complete set of technical specification
7. No deviation deviation certificate
8. List of tools and tackles
9. List of commissioning spares
10. Filled electrical load data sheet (Page 95 of 279)

Note: - Bidder to submit all the above mentioned document in .pdf file only, hard copies are not required.


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**AIR CONDITIONING SYSTEM
2X500 MW NEW NEYVELI**

SPECIFICATION NO. PE-TS-400 & 402-553-A001

VOLUME III

SECTION

REV 00

DATE: NOV 2014

SHEET 1 OF 1

DRAWING/DOCUMENT DISTRIBUTION LIST

All documents & drawings shall be in English and in metric units

SI		LII	NLC (HQ)	NLC-SITE	BHEL SITE	PMG BHEL	PEM/ UNITS/ PSSR	REMARKS
1	Master list of drawings / document (duly indicating schedule of submission)	Soft copy	Soft copy	Soft copy		Soft copy	Soft copy (S)	
2	Drawings / document for Approval/Information (First Submission)	Soft copy + 2 prints	Soft copy + 3 prints	Soft copy + 1 print		Soft copy	Soft copy (S)	
3	Return with comments/approval	Soft copy (S)	Soft copy	Soft copy		Soft copy	Soft copy	
4	Drawings / Documents for approval (second & subsequent submissions till approval)	Soft copy	Soft copy	Soft copy		Soft copy	Soft copy (S)	
5	Drawings / documents for distribution (Approved by NLC, in cat. 1 or Received for Information)	Soft copy + 2 print (HQ+ Site)	Soft copy + 3 prints	Soft copy + 3 prints	Soft copy + 5 prints	Soft copy	Soft copy (S)	
6	Erection Drawings / documents	-	Soft copy + 1 print	Soft copy + 3 prints	Soft copy + 5 prints	Soft copy	Soft copy (S)	
7	As built Drawings / documents	Soft copy + 1 print	Soft copy + 1 print	Soft copy + 3 prints	Soft copy + 5 prints	Soft copy	Soft copy (S)	
8	Operation & Maintenance Manual	-	Soft copy + 1 print	Soft copy + 10 prints	Soft copy + 5 prints	Soft copy	Soft copy (S)	
9	Type Test Certificate	Soft copy	Soft copy + 1 print	Soft copy + 3 prints	Soft copy + 5 prints	Soft copy	Soft copy (S)	

NOTES:

1. The above schedule of submission does not include Docs/Drgs. of quality assurance/inspection and delivery/dispatches. QAP documents to be submitted as per distribution schedule.
2. Date of submitting soft copy is to be taken as date of submission.
3. S – Source for generation of document.

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TECHNICAL SPECIFICATION
2X500 MW NEW NEYVELI

SPECIFICATION No: PE-TS-400 & 402-553-A001

VOLUME III

REV. 00

DATE: NOV 2014

DATA SHEET-B


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	Spec. No.: PE-TS-400 & 402-553-A001
WATER CHILLING MACHINE	Volume III
DATA SHEET 'B'	Sheet 1 of 4

SL.NO.	ITEM	UNIT	PARTICULARS
1	GENERAL		
1.1	Manufacturer		
1.2	Make and Model		
1.3	Type		
1.4	Capacity (Actual)	TR	
1.5	Qty.	No.	
1.6	Type of controls		
1.7	Refrigerant		
1.7.1	Name		
1.7.2	Charge for one machine	Kg	
1.8	No. of Stage		
1.9	Mode of start		
1.10	Type of capacity control		
1.11	Range of capacity variation		
1.12	Type of vibration isolation		
1.13	Reference Std.		
1.14	Overall operating weight	Kg	
1.15	Overall dimension	(LxWxH)	
1.16	Tube cleaning space		
2	COMPRESSOR		
2.1	Type		
2.2	Qty. per machine		
2.3	Make		
2.4	Model		
2.5	Motor rating	KW	
2.6	Operating speed	RPM	
2.7	Power consumption	KW	

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	Spec. No.: PE-TS-400 & 402-553-A001
WATER CHILLING MACHINE	Volume III
DATA SHEET 'B'	Sheet 2 of 4

3	CONDENSER		
3.1	Type	No.	
3.2	Qty. per machine		
3.3	Make		
3.4	Model		
3.5	Fluid in shell		
3.6	Fluid in tubes	CMH	
3.7	Water flow	m/s	
3.8	Water velocity	ft	
3.9	Pressure drop	deg. C	
3.10	Water in/out temp.	MKS	
3.11	Fouling rate	Deg. C	
3.12	Degree of sub cooling		
3.13	Material of construction		
3.13.1	Shell material thickness	mm	
3.13.2	Shell length/dia.	mm	
3.13.3	Tube material and thickness	mm	
3.13.4	Tube dia.	mm	
3.13.5	No. of tubes		
3.13.6	Type of fins		
3.13.7	Fin material		
4	CHILLER		
4.1	Type	No.	
4.2	Qty. per machine		
4.3	Make		
4.4	Model		
4.5	Fluid in shell		
4.6	Fluid in tubes		
4.7	Water flow	CMH	


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	Spec. No.: PE-TS-400 & 402-553-A001
WATER CHILLING MACHINE	Volume III
DATA SHEET 'B'	Sheet 3 of 4

4.8	Water velocity	m/s	
4.9	Pressure drop	ft	
4.10	Water in/out temp.	deg. C	
4.11	Fouling rate	MKS	
4.12	Degree of super heating	Deg. C	
4.13	Type and thickness of material	Mm	
4.14	Material of construction		
4.14.1	Shell material thickness	mm	
4.14.2	Shell length/dia.	mm	
4.14.3	Tube material and thickness	mm	
4.14.4	Tube dia.	mm	
4.14.5	No. of tubes		
4.14.6	Type of fins		
4.14.7	Fin material		
5	MOTOR		
5.1	Manufacturer		
5.2	Type		
5.3	Rating		
5.4	Voltage range		
5.5	Phase		
5.6	Frequency range		
5.7	Speed		
5.8	Locked rotor current		
5.9	Transmission		
5.10	Full load current		
5.11	Insulation class		
5.12	Duty		
5.13	Type of enclosure		

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	Spec. No.: PE-TS-400 & 402-553-A001
WATER CHILLING MACHINE	Volume III
DATA SHEET 'B'	Sheet 4 of 4

6	Inspection and testing	As per approved QAP	
7	Painting		
7.1	Shade		
7.2	Thickness		
7.3	Adhesion test		


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Spec. No.: PE-TS-400 & 402-553-A002

AIR HANDLING UNIT

Volume III

DATA SHEET 'B'

Sheet 1 of 5

S.NO	ITEM	UNIT	PARTICULARS
1	GENERAL		
1.1	Make		
1.2	Model		
1.3	Type		
1.4	Capacity	CFM	
1.5	Static pressure	mm WC	
1.6	Qty.	Nos.	
1.7	Overall weight	Kg	
1.8	Overall dimensions(LxWxH)	mm	
1.9	Discharge(side/top)		
2	COOLING COIL		
2.1	Type		
2.2	Sensible heat removing capacity	Kcal/hr.	
2.3	Latent heat removing capacity	Kcal/hr.	
2.4	Chilled water flow quantity	CUM per Hr.	
2.5	Chilled water in temperature	Deg. C	
2.6	Temperature rise	Deg. C	
2.7	Pressure drop of chilled water side	MW C	
2.8	Tube thickness and diameter	mm/mm	
2.9	Design pressure of tubes	Kg/Cm2(g)	
2.10	No. of rows	Nos	
2.11	Coil Face area	sqm	
2.12	Coil face velocity	m/s	
2.13	Air side pressure drop	mm WC	
2.14	Entering dry bulb temp.	Deg. C	
2.15	Entering wet bulb temp.	Deg. C	
2.16	Leaving dry bulb temp.	Deg. C	

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Spec. No.: PE-TS-400 & 402-553-A002

AIR HANDLING UNIT

Volume III

DATA SHEET 'B'

Sheet 2 of 5

2.17	Leaving wet bulb temp.	Deg. C	
3	DAMPER SECTION (FACE AND BYPASS)		
3.1	Max. press drop	mm WC	
3.2	Min. press drop	mm WC	
3.3	Modutrol motor included	Yes/No.	
3.3.1	Model No.		
3.3.2	Rating	KW	
3.3.3	Voltage/phase/freq.	V / / Hz	
3.4	Max. torque required by damper	Kgm	
3.5	Max. torque developed by motor	Kgm	
4	FILTER SECTION		
4.1	Type of filter	-	
4.2	Manufacturer	-	
4.3	No. of filters / AHU	-	
4.4	Size of each type	mmxmm	
4.5	Filter media		
4.6	Capacity	M ³ /Hr.	
4.7	Face area of each type	Sq.m/sq.ft.	
4.8	Face velocity across each type	M/Sec.	
4.9	Pressure drop across each type		
4.9.1	Clean condition	mm Wg	
4.9.2	Clogged condition	mm Wg	
4.10	Manometer to monitor filter condition	Yes/No	
4.11	Filter efficiency/test code	%	
5	FAN SECTION		
5.1	Type of fan		
5.2	Blades (backward / forward)		

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Spec. No.: PE-TS-400 & 402-553-A002

AIR HANDLING UNIT

Volume III

DATA SHEET 'B'

Sheet 3 of 5

5.3	Make/Model		
5.4	Capacity	cfm	
5.5	Static pressure	mm	
5.6	Qty. per AHU	RPM	
5.7	Outlet velocity	m/s	
5.8	Speed	RPM	
5.9	Motor	KW	
5.10	Motor speed	RPM	
5.11	Make of motor		
5.12	Type of motor		
5.13	Voltage/frequency/phase		


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Spec. No.: PE-TS-400 & 402-553-A002

AIR HANDLING UNIT

Volume III

DATA SHEET 'B'

Sheet 4 of 5

6	VIBRATION ISOLATORS		
6.1	Type		
6.2	No.		
6.3	Size		
6.4	Manufacturer		
7	PERFORMANCE		
7.1	Capacity	CUM/Hr.	
7.2	Total pressure	mm WC	
7.3	Outlet velocity	M/Sec	
7.4	Discharge	-	
7.5	No. of impellers	-	
7.6	Impeller dia	mm	
7.7	Impeller speed	RPM	
7.8	Shaft power	KW	
7.9	Motor rating	KW	
7.10	Motor speed	RPM	
8	MATERIAL OF CONSTRUCTION		
8.1	Inner skin (material and thickness)		
8.2	Outer skin (material and thickness)		
8.3	Insulation (type, density and thickness)		
8.4	Outer skin finish		
8.5	Panel thickness		
8.6	Drain pan (material and thickness)		
8.7	Sections (material and thickness)		
8.8	Fan impeller (material and thickness)		
8.9	Coil (material and thickness)		
8.10	Shaft (material and thickness)		
8.11	Filter frame work		
8.12	Filter media		

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Spec. No.: PE-TS-400 & 402-553-A002

AIR HANDLING UNIT

Volume III

DATA SHEET 'B'

Sheet 5 of 5

9

INSPECTION AND TESTING

As per approved QAP


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**COOLING TOWER FOR AC PLANT****DATA SHEET 'B'**

Spec. No.: PE-TS-400 & 402-553-A003

Volume III

Sheet 1 of 3

S.NO	ITEM	UNIT	PARTICULARS
1	GENERAL INFORMATION		
1.1	Manufacturer		
1.2	Model		
1.3	Type		
1.4	Quantity		
1.5	No. of cells (if applicable)		
1.6	Rated circulating water flow	M ³ /hr	
1.7	Design wet bulb temperature (ambient)	°C	
1.8	Design dry bulb temp.	°C	
1.9	Design cooling range	°C	
1.10	Design approach to ambient W.B. temperature	°C	
2	PERFORMANCNE DATA		
2.1	Evaporation loss (at design)	M ³ /hr	
2.2	Maximum drift loss	M ³ /hr	
2.3	Temperature of leaving air		
2.3.1	Dry bulb	°C	
2.3.2	Wet bulb	°C	
2.4	Total wet air per fan	kg/hr	
2.5	Heat transfer co-efficient	--	
2.6	Total fill volume	M ³	
2.7	Total vertical water fall height	M	
2.8	Gross louvered area	M ²	
3	MATERIALS OF CONSTRUCTION		
3.1	Casing		
3.2	Louvers		
3.3	Cell partition walls (if applicable)		
3.4	Basin partition walls		

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COOLING TOWER FOR AC PLANT

DATA SHEET 'B'

Spec. No.: PE-TS-400 & 402-553-A003

Volume III

Sheet 2 of 3

3.5	Fan stack		
3.6	Top deck		
3.7	Ladder		
3.8	Hot water piping		
3.9	Hot water distribution basin		
3.10	Hand rail		
3.11	Supporting structure		
3.12	Structural connectors		
3.13	Bolts, nuts, washers and other hardware		
3.14	Nails, anchor bolts		
3.15	Hot water distribution nozzles and splash plates or rotary sprinkler as applicable.		
3.16	Mechanical equipment support.		
4	DIMENSIONS		
4.1	Tower dimension length x width	M	
4.2	Tower height from basin curb to fan deck	M	
4.3	Overall height including basin	M	
5	HOT WATER SUPPLY		
5.1	Nominal dia.	M	
5.2	Type of connection	-	
6	TOWER BASIN		
6.1	Basin dimension		
6.1.1	Inside LXW	M	
6.1.2	Outside LXW	M	
7	DRIFT ELIMINATORS		
7.1	Type		
7.2	Material		
7.3	Type of treatment (if applicable)		
7.4	Fasteners-material		


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COOLING TOWER FOR AC PLANT

DATA SHEET 'B'

Spec. No.: PE-TS-400 & 402-553-A003

Volume III

Sheet 3 of 3

7.5	Type		
8	FAN		
8.1	Manufacturer		
8.2	Type		
8.3	No. of fan per cooling tower		
8.4	Model No.		
8.5	Diameter	M	
8.6	No. of blades	-	
8.7	Blade tip clearance	-	
8.8	Fan speed	RPM	
9	ACCESSORIES		
9.1	Make-up connection		
9.2	Quick fill connection		
9.3	Over flow and drain connection		
9.4	Support and supporting structure for mounting		
9.5	Level switch		
9.6	Rain protection for motor		
10	INSPECTION AND TESTING	As per approved QAP	

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Spec. No.: PE-TS-400 & 402-553-A004

CENTRIFUGAL PUMP

Volume III

DATA SHEET 'B'

Sheet 1 of 2

SL.NO.	ITEM	UNIT	PARTICULARS
1	Manufacturer		
2	Designation of pump		
3	Model No.		
4	Type of pump		
5	Nos. provided		
6	Capacity	M ³ /hr	
7	TDH at rated capacity	MWC	
8	Pump rated speed	RPM	
9	NPSH required	MWC	
10	Pump efficiency at duty point	%	
11	Power required at pump Shaft at duty point	KW	
12	Maximum power required at any operating point	KW	
13	Motor capacity	KW	
14	Material of construction & code conformance		
14.1	Casing		
14.2	Shaft		
14.3	Impeller		
14.4	Bearings		
14.5	Wearing ring		
14.6	Shaft sleeve		
14.7	Stuffing box packing		
14.8	Base plate	--	
14.9	Pump motor coupling	--	
14.10	Counter flanges	--	
14.11	Bolts &nuts	--	
14.12	Stuffing box bush	--	
14.13	Stuffing box gland		
15	Bearing (type & nos. provided per set)	--	


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Spec. No.: PE-TS-400 & 402-553-A004

CENTRIFUGAL PUMP

Volume III

DATA SHEET 'B'

Sheet 2 of 2

16	Method of lubrication of bearings	--	
17	Type of shaft sealing arrangement	--	
18	Coupling (type)		
19	Coupling guard provided?	Yes/No	
20	Base plates, foundation bolts and hardwares Provided.	Yes/No	
21	Lifting lugs, eye bolts etc. provided for each pump drive set.	Yes/No	
22	Counter flanges with nuts, bolts and gaskets provided?	Yes/No	
23	Weights	Kg	
23.1	Weight of pump only	Kg	
23.2	Weight of motor	Kg	
24	Testing		
24.1	Hydrostatic test pressure	Kg/cm ² (g)	
24.2	Duration of test	Hr	
24.3	Testing and inspection provided as per purchaser's requirement	Yes/no	
25	Painting details Painting details would be furnished to the successful bidder during contract stage.		
26	Inspection and testing	As per approved QAP	


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	Spec. No.: PE-TS-400 & 402-553-A005
PACKAGE UNIT	Volume III
DATA SHEET 'B'	Sheet 1 of 4

S.NO	ITEM	UNIT	PARTICULARS
1	GENERAL		
1.1	Make		
1.2	Model		
1.3	Type		
1.4	Capacity		
1.5	Qty.		
1.6	Refrigerant		
1.7	Overall dimensions		
1.7.1	Indoor unit	(LxWxH)	
1.7.2	Outdoor unit	(LxWxH)	
1.8	Overall weight		
1.8.1	Indoor unit	Kg	
1.8.2	Outdoor unit	Kg	
1.9	Suction temperature	°C	
1.10	Condensing temperature	°C	
1.11	Ambient temperature DB	°C	
2	COMPRESSOR		
2.1	Make		
2.2	model		
2.3	Type		
2.4	No. of compressor per package unit		
2.5	Speed	RPM	
2.6	Power requirement for each compressor		
2.7	Motor speed	RPM	
2.8	Suction temperature	°C	
2.9	Condensing temperature	°C	
2.10	Ambient temperature DB	°C	

 Praveen Khatwa
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 Vikram Jais



	Spec. No.: PE-TS-400 & 402-553-A005
PACKAGE UNIT	Volume III
DATA SHEET 'B'	Sheet 2 of 4

3	CONDENSER		
3.1	FOR AIR COOLED UNIT		
3.1.1	Total air quantity	(Cum./hr.)	
3.1.2	No. of fans/types of fan		
3.1.3	Fan diameter		
3.1.4	Blade material		
3.1.5	Fan speed	(RPM)	
3.1.6	Fan shaft material		
3.1.7	Direct drive / belt drive		
3.1.8	Fan Motor HP / Voltage		
3.1.9	Design pressure	kg / Sqcm	
3.1.10	Test pressure	kg / Sqcm	
3.1.11	Tube material and thickness		
3.1.12	Fin material and thickness		
3.1.13	Fin spacing		
3.1.14	No. of row	Nos	
3.2	FOR WATER COOLED UNIT		
3.2.1	Total water quantity	(Cum./hr.)	
3.2.2	Pressure drop	(mm WG)	
3.2.3	Water temperature in	Deg C	
3.2.4	Water temperature out	Deg C	
3.2.5	Design pressure	kg / Sqcm	
3.2.6	Test pressure	kg / Sqcm	
3.2.7	Tube material		
3.2.8	Shell material		
4	EVAPORATOR		
4.1	Tube material		
4.2	Tube dia.	mm	



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S.A. Khan



Vikram Jais



Spec. No.: PE-TS-400 & 402-553-A005

PACKAGE UNIT

Volume III

DATA SHEET 'B'

Sheet 3 of 4

4.3	Fin spacing		
4.4	No. of rows	Nos	
4.5	Coil face area	Sqm	
4.6	Total air quantity	Cum/hr	
4.7	Cooling capacity		
4.8	On coil air temperature DB / WS	Deg C	
4.9	Coil leaving air temperature DB / WB	Deg C	
4.10	Refrigerant temperature	Deg C	
4.11	Filter material		
4.12	Filter efficiency as per AFI		
4.13	Filter pressure drop	mm WG	
4.14	Blower capacity	cmh	
4.15	Blower speed	RPM	
4.16	Type of blower / blades		
4.17	Blower motor	KW	
5	AUXILIARIES SUPPLIED		
5.1	High pressure gauge		
5.2	Crank case heater		
5.3	Low pressure gauge		
5.4	Base plate		
5.5	HP cutout		
5.6	LP cutout		
5.7	Automatic unloading device		
5.8	Oil failure switch		
5.9	Pressure relief valve		
5.10	Unloaded starting device		
6	OTHER QUERIES		
6.1	Are starters for compressor, fan / blowers provided within the units?		

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S. A. Khan
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Vishal Jha



Spec. No.: PE-TS-400 & 402-553-A005

PACKAGE UNIT

Volume III

DATA SHEET 'B'


Sheet 4 of 4

6.2	Noise level of packaged unit (low side) dBA at a distance 1M.		
6.3	Noise level of condenser unit (outdoor) dBA at a distance 1M.		
6.4	Is condenser assembly including motor suitable for outdoor installation?		
6.5	Are fusible plug and pressure relief valve for condenser provided within the units?		
6.6	Vibration isolation type		
6.7	Refrigerant piping		
6.8	Material		
6.9	Diameter and thickness		
6.10	Insulation		


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		Spec. No.: PE-TS-400 & 402-553-A006
	AIR FILTER	Volume III
	DATA SHEET 'B'	Sheet 1 of 1

S.NO	ITEM	UNIT	PARTICULARS
1	Manufacture	--	
2	Model No.	--	
3	Type	--	
4	Size	mm xmmxmm	
5	Rating	M ³ /hr	
6	Nos.	--	
7	Efficiency	Microns	
8	Test method	--	
9	Press drop at clean conditions	Mm wg	
10	Press drop at dirty conditions	Mm wg	
11	Filter media	--	
12	Whether cleanable	--	
13	Material of frame	--	
14	Weight of filter	Kg	
15	Filter frame	--	
15.1	Type		
15.2	Material		
16	Filter media support		


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 S.A. Khan

 Vikram Jais



GI SHEET AND ACCESSORIES

Spec. No.: PE-TS-400-553-A007

Volume - III

DATA SHEET 'B'

Sheet 1 of 1

S.NO	ITEM	UNIT	PARTICULARS
1	GENERAL		
1.1	Make		
1.2	Sheet size		
1.3	Gauge		
1.4	Zinc coating		
1.5	IS std. for GI sheet		
2	GENERAL		
2.1	Material		
2.2	Gauge		
3	GUIDE VANES		
3.1	Material		
3.2	gauge		


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**SPLIT AC UNITS**

Spec. No.: PE-TS-400 & 402-553-A008

Volume - III

DATA SHEET 'B'

Sheet 1 of 2

S.NO	ITEM	UNIT	PARTICULARS
1	Make		
2	Model no.		
3	Nominal capacity	TR/KW	
4	Power consumption		
5	EER		
6	Star rating		
7	Overall dimensions		
7.1	Indoor unit		
7.2	Outdoor unit		
8	Overall weight		
8.1	Indoor unit		
8.2	Outdoor unit		
9	Refrigerant		
10	OUTDOOR UNIT		
10.1	Inlet air temp.		
10.2	Fan power		
10.3	Fan motor rating		
10.4	Condenser air quantity		
10.5	No. of fans		
11	INDOOR UNIT		
11.1	Fan type		
11.2	Air quantity		
11.3	Static pressure		
11.4	Rated speed		
11.5	Consumed power		
11.6	ACCESSORIES		
12	Unloaded starting device		
12.1	Capacity control arrangement		
12.2	HP cutout switch		

Praveen Khatwa
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S.A. Khan
S.A. Khan
Vishal Jha
Vishal Jha



SPLIT AC UNITS

DATA SHEET 'B'


Spec. No.: PE-TS-400 & 402-553-A008

Volume - III

Sheet 2 of 2

12.3	LP cutout switch		
12.4	Refrigerant piping between indoor and outdoor unit with insulation		
12.5	Remote control		

Praveen Kothare
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Vishal Jha
Vishal Jha

		Spec. No.: PE-TS-400 & 402-553-A009
	FRESH AIR FANS (AXIAL FLOW)	Volume III
	DATA SHEET 'B'	Sheet 1 of 1

SL.NO.	ITEM	UNIT	PARTICULARS
1	Manufacturer	--	
2	Model No.	--	
3	Nos. offered	--	
4	Purpose	--	
5	Static pressure at rated speed	MMWG	
6	Total pressure at rated speed	MMWG	
7	Outlet velocity of air	M/sec	
8	Rated speed	RPM	
9	Impeller dia	MM	
10	No. of blades	--	
11	Pitch angle	Degree	
12	Efficiency at rated speed	%	
13	Fan power at rated speed	KW	
14	Recommended/selected motor	KW	
15	Material of impeller & thickness and code conference	MM	
16	Material & thickness of	MM	
16.1	Impeller		
16.2	casing		
17	Type of bearing & material		
18	Type of drive & manufacturer		
19	Motor data		
19.1	Voltage, phase, frequency	V/ph/HZ	
19.2	Rated KW	KW	
19.3	Type of enclosure	--	
19.4	Type of insulation	--	
19.5	Motor design ambient of temp.	°C	
20	Fan statically & dynamically balanced		
21	Weight of fan/motor/base drive	Kg	
22	Fan sound pressure level at 3 impeller dia from center of fan inlet/outlet (with ref. To 10 ⁵ N/M ²)	Db (A)	

 Praveen Khatwa
 S.A. Mohan
 Vignesh Jais



PIPES

Spec. No.: PE-TS-400 & 402-553-A010

Volume - III

DATA SHEET 'B'

Sheet 1 of 1

S.NO	ITEM	UNIT	PARTICULARS
1	MS PIPES		
1.1	Make		
1.2	Size		
1.3	Qty.		
1.4	Ref IS std.		
1.5	Class		
2	GI PIPES		
2.1	Make		
2.2	Size		
2.3	Qty.		
2.4	Ref IS std.		
2.5	Class		


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Spec. No.: PE-TS-400 & 402-553-A011

INSULATION

Volume - III

DATA SHEET 'B'

Sheet 1 of 2

S.NO	ITEM	UNIT	PARTICULARS
1	DUCT INSULATION		
1.1	Make		
1.2	Type of insulation		
1.3	Standard		
1.4	Thickness		
1.4.1	Supply air duct		
1.4.2	Internal lining		
1.4.3	Return air duct		
1.5	Density		
1.5.1	Supply air duct		
1.5.2	Internal lining		
1.5.3	Return air duct		
1.6	Form of insulation		
1.6.1	Supply air duct		
1.6.2	Internal lining		
1.6.3	Return air duct		
1.7	Thermal conductivity		
1.7.1	Supply air duct		
1.7.2	Internal lining		
1.7.3	Return air duct		
1.8	Maximum service temp.		
1.9	Water vapor presence		
1.10	Moisture absorption IS:8183		
2	PIPE INSULATION		
2.1	Make		
2.2	Type of insulation		
2.3	Standard		
2.4	Thickness		
2.4.1	Chilled water pipe		

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S.A. Khan
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Vishal Jha



INSULATION

DATA SHEET 'B'

Spec. No.: PE-TS-400 & 402-553-A011

Volume - III

Sheet 2 of 2

2.4.2	Drain pipe		
2.5	Density		
2.5.1	Chilled water pipe		
2.5.2	Drain pipe		
2.6	Form of insulation		
2.6.1	Chilled water pipe		
2.6.2	Drain pipe		
2.7	Thermal conductivity		
2.7.1	Supply air duct		
2.7.2	Internal lining		
2.7.3	Return air duct		

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Praveen Khatwa
S.A. Khan
S.A. Khan
Vishal Jais
Vishal Jais

**MOTORISED FIRE DAMPER**

Spec. No.: PE-TS-400 & 402-553-A012

Volume - III

DATA SHEET 'B'

Sheet 1 of 1

S.NO	ITEM	UNIT	PARTICULARS
1	GENERAL		
1.1	Make		
1.2	Model/Type		
1.3	Ref standard/codes		
1.4	Fire rating		
1.5	Mounting		
1.6	Construction		
2	CASING		
2.1	Construction		
2.2	Material		
2.3	Thickness		
2.4	Welding		
3	BLADES		
3.1	Construction		
3.2	Thickness		
3.3	Material		
3.4	Bearing		
3.5	Shaft		
3.6	Shaft material		
4	LINKAGE		
4.1	Drive end		
4.2	Material		
5	ACTUATOR		
5.1	Model		
5.2	Rating		

Praveen Khatke
Praveen Khatke

S.A. Khan
S.A. Khan

Vishal Jais
Vishal Jais

**BALANCING VALVES**

Spec. No.: PE-TS-400 & 402-553-A013

Volume - III

DATA SHEET 'B'

Sheet 1 of 1

S.NO	ITEM	UNIT	PARTICULARS
1	Make		
2	Size and quantity		
3	Body and bonnet		
4	Seat		
5	Steam sealing		
6	Spindle (stem)		
7	Hand wheel		
8	Double regulation		
9	Measurement of pressure drop and flow rate		
10	Flanged connection		
11	Leakage resistance		
12	Design pressure		
13	Design Temp.		
14	Hydraulic test pressure		
15	Maximum liquid Temp.		
16	Maximum PH value of liquid		
17	Medium		
18	Inspection and testing	As per material test certificate	

Praveen Khatore

S.A. Joshi

Vikram Joshi



TITLE:
TECHNICAL SPECIFICATION
COMPLIANCE CUM CONFIRMATION
CERTIFICATE

SPEC. NO.: PE-TS-400 & 402-553-A001
 VOLUME: III
 SECTION:
 REV. NO. 0 DATE: NOV-2014
 SHEET 1 OF 2

COMPLIANCE CUM CONFIRMATION CERTIFICATE

The bidder shall confirm compliance with following by signing/ stamping this compliance certificates (every sheet) and furnishes same with the offer.

- a) The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusions, other than those resolved as per 'Schedule of Deviations', with regard to same.
- b) There are no other deviations w.r.t. specifications other than those furnished in the 'Schedule of Deviations'. Any other deviation, stated or implied, taken elsewhere in the offer stands withdrawn unless specifically brought out in the 'Schedule of Deviations'
- c) Bidder shall submit QP in the event of order based on the guidelines given in the specification & QP enclosed therein. QP will be subject to BHEL/ CUSTOMER approval & customer hold points for inspection/ testing shall be marked in the QP at the contract stage. Inspection/ testing shall be witnessed as per same apart from review of various test certificates/ Inspection records etc. This is within the contracted price without any extra implications to BHEL after award of the contract.
- d) All drawings/ data-sheets/ calculations etc. submitted along with the offer shall be considered for reference only, same shall be subject to BHEL/ CUSTOMER approval in the event of order.
- e) The offered materials shall be either equivalent or superior to those specified in the specification & shall meet the specified/ intended duty requirements. In case the material specified in the specifications is not compatible for intended duty requirements then same shall be resolved by the bidder with BHEL during the pre - bid discussions, otherwise BHEL/ Customer's decision shall be binding on the bidder whenever the deficiency is pointed out.

 For components where materials are not specified, same shall be suitable for intended duty, all materials shall be subject to approval in the event of order.
- f) The commissioning spares shall be supplied on 'As Required Basis' & prices for same included in the base price itself. Prices for special tools & tackles, if any, shall also be included in the base price.
- g) All sub vendors shall be subject to BHEL/ CUSTOMER approval in the event of order.
- h) The performance guarantees shall stand valid till at least eighteen (18) months after commissioning of AC system or as per commercial terms and conditions whichever is more.
- i) In the event of order, all the material required for completing the job at site shall be supplied by the bidder within the ordered price even if the same are additional to approved billing break up, approved drawing or approved Bill of quantities. This clause will apply in case during site commissioning additional requirements emerges due to customer and/ or consultant's comments. No extra claims shall be put on this account
- j) Schedule of drawings submissions, comment incorporations & approval shall be as stipulated in the specifications. The successful bidder shall depute his design personnel to BHEL's/ Customer's/ Consultant's office for across the table resolution of issues and to get documents approved in the stipulated time.

(Handwritten signatures and stamps on the right margin)
 Praveen Khatwa
 S.A. Mohan
 Vikram Jain



TITLE:
TECHNICAL SPECIFICATION
COMPLIANCE CUM CONFIRMATION
CERTIFICATE

SPEC. NO.: PE-TS-400 & 402-553-A001
VOLUME: III
SECTION:
REV. NO. 0 DATE: NOV-2014
SHEET 2 OF 2

- k) As built drawings shall be submitted as and when required during the project execution.
- l) That the bidder has not tempered with this compliance cum confirmation certificate and if at any stage any tempering in the signed copy of this document is noticed then same shall be treated as breach of contract and suitable actions shall be taken against the bidder.
- m) Any commercial documents / deviations shall not be considered during technical evaluation. Moreover any technical deviations included in commercial deviation either explicit or implicit shall be considered null and void even if agreed by BHEL during commercial evaluation stage


Praveen Mishra

S A Mohan

Vikram Jais

**2X500MW NEW NEYVELI TPP
AIR CONDITIONING SYSTEM
MASTER DRAWING LIST (MDL)**

DOCUMENTS TO BE FURNISHED BY AC VENDOR

S. No.	Drawing / Document No.	Drawing / Document Title	Submission Schedule (WEEKS)
1*	PE-V0-400-553-A001	ITEM CATEGORISATION LIST & SUBVENDOR LIST	4
2*	PE-V0-400-553-A002	QUALITY PLAN OF SCREW CHILLERS	14
3*	PE-V0-400-553-A003	QUALITY PLAN OF VAM	14
4*	PE-V0-400-553-A004	QUALITY PLAN OF CENTRIFUGAL PUMPS	15
5*	PE-V0-400-553-A005	QUALITY PLAN OF COOLING TOWER	15
6	PE-V0-400-553-A006	QUALITY PLAN OF AHU	14
7*	PE-V0-400-553-A007	QUALITY PLAN OF MOTOR	15
8*	PE-V0-400-553-A008	QUALITY PLAN OF MOTOR	14
9*	PE-V0-400-553-A101	HEAT LOAD CALC FOR MAIN CONTROL ROOM AREAS IN TG BLDG, ESP CONTROL ROOM BUILDING AND SERVICE BUILDING.	4
10*	PE-V0-400-553-A102	PRESSURE DROP CALC FOR CHILLED WATER PIPING & CONDENSER WATER PIPING	10
11*	PE-V0-400-553-A103	CONTROL & OPERATION PHILOSOPHY OF AC SYSTEM	12
12*	PE-V0-400-553-A201	DATA SHEET AND GA FOR SCREW CHILLER	16
13*	PE-V0-400-553-A202	DATA SHEET AND GA FOR VAM	16
14*	PE-V0-400-553-A203	DATA SHEET AND GA FOR AHUs AND FCUs	14
15*	PE-V0-400-553-A204	DATA SHEET AND GA FOR CONDENSER WATER AND CHILLED WATER PUMPS	15
16*	PE-V0-400-553-A205	DATA SHEET AND GA FOR COOLING TOWER	15
17*	PE-V0-400-553-A206	DATA SHEET AND GA FOR SOFTENING EQUIPMENT	16
18*	PE-V0-400-553-A207	DATA SHEET AND G.A. FOR PRE AND FINE FILTER ALONGWITH FIXING DETAILS.	10
19*	PE-V0-400-553-A208	DATA SHEET AND GA FOR FIRE DAMPER ALONGWITH FIXING DETAILS.	10
20*	PE-V0-400-553-A209	DATA SHEET AND GA FOR FRESH AIR FANS	12
21*	PE-V0-400-553-A211	DATA SHEET AND GA DRAWINGS FOR VALVES (BALANCING, GATE, NRV, B/F, MOTORISED B/F, Y-STRAINER AND OTHER VALVES AS APPLICABLE)	9
22*	PE-V0-400-553-A212	DATA SHEET AND GA FOR 3 WAY MOTORISED VALVE	8
23*	PE-V0-400-553-A213	DATA SHEET AND GA FOR HEATER PACKAGE	7
24*	PE-V0-400-553-A214	DATA SHEET AND GA FOR PAN HUMIDIFIER	7
25*	PE-V0-400-553-A215	DATA SHEET FOR INSTRUMENTS (TEMPERATURE GAUGE, PRESSURE GAUGE, PRESSURE SWITCH, SENSORS - TEMPERATURE & HUMIDITY, LEVEL GAUGE, LEVEL SWITCH & DIFFERENTIAL PRESSURE SWITCH AND OTHER APPLICABLE INSTRUMENTS).DATA SHEET AND GA FOR WATER SOFTENING PLANT.	12
26*	PE-V0-400-553-A216	DATA SHEET OF INSULATION FOR DUCT, PIPE AND ACCOUSTIC LINING ALONG WITH TYPICAL DETAIL FOR DUCT, PIPE AND ACCOUSTIC INSULATION	12
27*	PE-V0-400-553-A217	DATA SHEET FOR SPLIT AC	12
28*	PE-V0-400-553-A218	DATA SHEET FOR PIPES	5
29*	PE-V0-400-553-A219	DATA SHEET FOR GI SHEET	5
30*	PE-V0-400-553-A220	DATA SHEET AND GA DRAWING FOR GRILLS / DIFFUSERS / DAMPERS ETC	8
31*	PE-V0-400-553-A221	DATA SHEET AND GA DRAWING FOR SOFT WATER, EXPANSION AND MAKEUP WATER TANK	5
32*	PE-V0-400-553-A222	TDS AND GA OF MOTOR (PUMP, COOLING TOWER, AHU)	15
33*	PE-V0-400-553-A223	TDS AND GA OF DESUPERHEATING STATION	14
34*	PE-V0-400-553-A224	TDS AND GA OF CENTRIFUGAL CHILLER	16
35*	PE-V0-400-553-A225	TDS AND GA OF PLC SYSTEM COMPLETE WITH I/O LIST CONFIGURATION DIAGRAM, BILL OF MATERIAL GA & INTERNAL WIRING AND LOGIC FLOW DIAGRAM, PLC ROOM LAYOUT.	
36*	PE-V0-400-553-A501	P&I DIAGRAM FOR AC SYSTEM	8
37*	PE-V0-400-553-A502	AC PLANT ROOM LAYOUT, COOLING TOWER AREA LAYOUT WITH EQPT FOUNDATION DETAILS	15
38*	PE-V0-400-553-A503	AC DUCT LAYOUT DRAWING FOR CONTROL ROOM AREAS AT 17M ALONG WITH AHU ROOM LAYOUT WITH FOUNDATION DETAILS	16
39*	PE-V0-400-553-A504	AC DUCT & AHU ROOM LAYOUT WITH FOUNDATION DETAIL FOR UPS BATTERY CHARGER ROOM AT 8.5M AND SWAS ROOM AT 0 M	17
40*	PE-V0-400-553-A505	CHILLED & CONDENSER WATER PIPING LAYOUT INSIDE AC PLANT, COOLING TOWER, AHU ROOMS IN ALL BUILDING AND INTERCONNECTING CHILLED WATER PIPE FROM PLANT ROOM TO ALL AHU ROOM.	20


 Praveen Kishore

 S A Mohan

 Vinay Jha

**2X500MW NEW NEYVELI TPP
AIR CONDITIONING SYSTEM
MASTER DRAWING LIST (MDL)**

DOCUMENTS TO BE FURNISHED BY AC VENDOR

S. No.	Drawing / Document No.	Drawing / Document Title	Submission Schedule (WEEKS)
41*	PE-V0-400-553-A506	AC DUCTING & DIFFUSER LAYOUT FOR ESP CONTROL ROOM ALONG WITH AHU ROOM LAYOUT WITH FOUNDATION DETAIL.	18
42*	PE-V0-400-553-A507	AC DUCTING & DIFFUSER LAYOUT FOR SERVICE BUILDING ALONG WITH AHU ROOM LAYOUT WITH FOUNDATION DETAIL.	18
43*	PE-V0-400-553-A508	TYPICAL Details DUCT: FABRICATION, SUPPORT AND ERECTION. INSULATION: DUCTING, PIPING, EQUIPMENTS AND ACOUSTIC LINING. PIPING: FABRICATION, SUPPORT AND ERECTION	7
44*	PE-V0-400-553-A509	SPLIT AC SCHEDULE	16
45	PE-V0-400-553-A601	ELECTRICAL FEEDER LIST	18
46	PE-V0-400-553-A602	CABLE SCHEDULE	22
47	PE-V0-400-553-A901	DEMONSTRATION TEST	12
48	PE-V0-400-553-A902	O & M MANUAL	22

Notes

- 1 Submission schedule (Week) is from date of LOI to Package vendor.
- 4 This MDL is tentative and shall be finalised during detail Engineering.
- 5 The drawings/ documents submitted by vendor shall be complete in all respects with revised drawing submitted incorporating all comments. Any 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 himself depute his personal to BHEL / Customer's place any number of time as per the requirement for across the table discussions/ finalizations/ submissions of drawings
- 6 Star marked (*) documents shall be treated as basic Engineering documents.


 Praveen Kishore

 S A Mohan

 Vignesh Jais



SCHEDULE OF TECHNICAL DEVIATION
PROJECT:-2X500 MW NEW NEYVELI TPP
PACKAGE:-AC SYSTEM

NAME OF VENDOR:-

SL NO	VOULME/ SECTION	PAGE NO.	CLAUSE NO.	TECHNICAL SPECIFICATION/ TENDER DOCUMENT	COMPLETE DESCRIPTION OF DEVIATION	COST OF DEVIATION	PORTION OF PRICE SCHEDULE ON WHICH COST OF DEVIATION IS APPLICABLE	NATURE OF COST OF DEVIATION (POSITIVE/ NEGATIVE)	WHETHER COST OF DEVIATION INCLUDED/ EXCLUDED IN PRICE BID	REMARKS
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TECHNICAL DEVIATIONS

PARTICULARS OF BIDDERS/ AUTHORISED REPRESENTATIVE

NAME	DESIGNATIONS	SIGN & DATE	COMPANY SEAL

NOTES:

1. Cost of deviation will be applicable on the basic price (i.e. excluding taxes, duties & freight) only.
2. All the bidders have to list out all of their Technical Deviations in detail in the above format on cost basis (if any).


 Chandrasekhar
 Project Officer


 S. A. V. S.
 Project Officer


 S. A. V. S.
 Project Officer

3. Any deviation not mentioned above and shown separately will not be taken cognizance of and the offer shall be liable for rejection.

4. Bidder shall indicate "quoted" in cost of deviation column of the schedule above along with their Technical offer.

5. Bidder shall furnish priced schedule of technical deviation along with price bid in sealed envelop.

6. The final decision of acceptance/ rejection of the deviations quoted by the bidder along with its cost shall be at discretion of the Purchaser.

7. Bidders to note that any deviation not listed above and asked after Part I Bid opening shall not be considered.

8. Bidders to note that no Price Impact will be acceptable after Part I Bid opening subject to if there is any change in Technical Specification/NIT terms from BHEL side.

9. Deviation listed above without any cost of deviation, if found acceptable to BHEL, will be considered without any price implication.


Rajiv Kumar
Purchaser (BHEL)


S. A. Kumar
S. A. Kumar


S. A. Kumar
S. A. Kumar

AC SYSTEM FOR 2x500 MW NEW NEYVELLI TPP (TG PACKAGE) --- SUGGESTIVE PRICE FORMAT														
SL No	DESCRIPTION OF EQUIPMENT/ ITEM	QTY	UNIT	SUPPLY						ERECTION AND COMMISSIONING				TOTAL
				Unit Price (Rs)	Total ex-works price (Rs)	ED (IncCESS) (Rs)	CST / VAT (Rs)	Freight (Including service tax, if applicable) (Rs)	TOTAL FOR site price SUPPLY (Rs)	Unit Price (Rs)	Total price (Rs)	Service Tax (Rs)	TOTAL PRICE (Erection and commissioning including Service tax)	Total Price Supply FOR site and E&C including service tax (Rs)
1.0	LUMPSUM PRICES													
1.1	Total lumpsum firm prices for equipment & Services as specified, Comprising Engineering, design, manufacture, inspection & Testing at manufacturers works/subvender's work, Painting at manufactures works, duty packed for transportation, delivery to site, unloading storage & handling at site, erection & commissioning, carrying out acceptance tests at site, final painting and handing over to customer the complete AC system on turnkey basis for 2X500 MW NNTTP as per specification PE-TS-400 & 402-553-A001 including special tool & tacksels for maintenance, commissioning spares, all taxes, duties etc.													
2.0	Break up prices for items covered in clause 1.0 above. In case, price indicated above does not match with item wise break-up given at 2.0, the highest price so calculated shall be considered for evaluation but in case of order, the same shall be placed at lowest price.													
3.0	AC plant -1 (Main control room areas in power house building and Service building)													
3.1	Water Chilling packages , each of minimum 250 TR capacity consisting of Vapour Absorption Machine complete with high temperature generator, low temperature generator/ condenser assembly, Evaporator/ absorber assembly with eliminators, regenerative heat exchangers, purge recovery units, absorbent pumps, refrigerant pumps all interconnecting piping, valve and other accessories, micro processor based/PLC control panel incorporating controls safety & interlocks, required charge of lithium bromide solution and refrigerant for all the units, cooling/heating switch valves, structural mounting base for all the components etc and accessories as specified including PRDS, condensate tank, condensate pump and desuperheating pump.	2	NO											
3.2	Water chilling packages , each of minimum 250 TR capacity consisting of Centrifugal refrigerant compressor complete with motors, control panel, multi drive set, controls and interlocks other accessories as specified, Water cooled condenser adequately sized & other accessories and Shell & tube type water chiller & other accessories, as specified.	1	NO											


 S. A. K. Srinivas
 Project Officer

AC SYSTEM FOR 2x500 MW NEW NEYVELLI TPP (TG PACKAGE) --- SUGGESTIVE PRICE FORMAT														
SL No	DESCRIPTION OF EQUIPMENT/ ITEM	QTY	UNIT	SUPPLY						ERECTION AND COMMISSIONING				TOTAL
				Unit Price (Rs)	Total ex-works price (Rs)	ED (Inc CESS) (Rs)	CST / VAT (Rs)	Freight (Including service tax, if applicable) (Rs)	TOTAL FOR price site SUPPLY (Rs)	Unit Price (Rs)	Total price (Rs)	Service Tax (Rs)	TOTAL PRICE (Erection and commissioning including Service tax)	Total Price Supply FOR site and E&C including service tax (Rs)
3.3	Sheet metal cabinet type air handling units (double skin as per specification) consisting of chilled water cooling coil, centrifugal blower, TEFC sq cage induction motor, drive set, filters (pre filter at inlet and fine filters & HEPA filter at the outlet of each AHU), 3 way motorised mixing valve with thermostatic controls and other accessories to meet the AC load of control room areas at 17.00 M of power house building.	3	NO											
3.4	Sheet metal cabinet type air handling units (double skin as per specification) consisting of chilled water cooling coil, centrifugal blower, TEFC sq cage induction motor, drive set, filters (pre filter at inlet and fine filters & HEPA filter at the outlet of each AHU), 3 way motorised mixing valve with thermostatic controls and other accessories to meet AC load of control room areas at 8.50 M of power house building.	2	NO											
3.5	Sheet metal cabinet type air handling units (double skin as per specification) consisting of chilled water cooling coil, centrifugal blower, TEFC sq cage induction motor, drive set, filters (pre filter and fine filters), 3 way motorised mixing valve with thermostatic controls and other accessories to meet the AC load requirement of complete service building. Each floor to be provided with 2 x 50% AHU.	1	Lot											
3.6	Fibreglass reinforced plastic (FRP) construction cooling towers complete with fan, motor (VFD DRIVEN), FRP basin, nozzles, make up water & quick fill water connection, level witch, drains, piping, valves, strainers, ladder & all accessories as specified.	3	NO											
3.7	Centrifugal pump sets for condenser water recirculation complete with TEFC motor & all accessories as specified.	3	NO											
3.8	Centrifugal pump sets for chilled water recirculation complete with TEFC motor & all accessories, as specified.	3	NO											
3.9	HDPE / MS Make up Tank 2 cubm (Inner surface for MS Tank - spray galvanised). Make up water line with float valve & backup, quick fill line with ball valve, drain line with ball valve, overflow & vent line, level gauge shall be provided).	1	Nos											
3.10	HDPE / MS Storage Tank 8 cubm (Inner surface for MS Tank - spray galvanised). Make up water line with float valve & backup, quick fill line with ball valve, drain line with ball valve, overflow & vent line, level gauge shall be provided).	2	NO											


 S. A. Kumar
 Project Officer

AC SYSTEM FOR 2x500 MW NEW NEYVELLI TPP (TG PACKAGE) --- SUGGESTIVE PRICE FORMAT														
SL No	DESCRIPTION OF EQUIPMENT/ ITEM	QTY	UNIT	SUPPLY						ERECTION AND COMMISSIONING				TOTAL
				Unit Price (Rs)	Total ex-works price (Rs)	ED (Inc CESSION) (Rs)	CST / VAT (Rs)	Freight (Including service tax, if applicable) (Rs)	TOTAL FOR site price SUPPLY (Rs)	Unit Price (Rs)	Total price (Rs)	Service Tax (Rs)	TOTAL PRICE (Erection and commissioning including Service tax)	Total Price Supply FOR site and E&C including service tax (Rs)
3.11	HDPE / MS chilled water Expansion Tank (Inner surface for MS Tank - spray galvanised) 1 cubm (insulated) with all accessories as required.	1	NO											
3.12	Water softening plant with pump set and all the accessories as required to meet system requirement.	2	NO											
3.13	CONDENSER WATER PIPING with necessary fittings like tees, reducers, expanders, elbows, flanges, all types of valves with flanges, strainers with flanges, air vents etc as per specifications. This item shall cover the entire condenser water piping (pipe, valves, strainers and all supporting accessories) for the entire Job.	1	LOT											
3.14	INSULATED CHILLED WATER PIPING with necessary fittings like tees, reducers, expanders, elbows, flanges, all types of valves with flanges, strainers with flanges, air vents etc as per specifications. This item shall cover the entire chilled water piping for all AC plants except for main chilled water pipe header from main AC plant upto ESP building AHU room.	1	LOT											
3.15	MS medium class DRAIN WATER PIPING from various equipment like cooling tower (including equalising line), condenser water pumps, AHU, FCU, Chilled water pump etc upto nearest available drain point with necessary fittings like tees, reducers, expanders, elbows, flanges, valves with flanges, P trap etc as per specifications. Piping serving chilled water shall be insulated as per specification , whereas piping serving condenser water shall be uninsulated.													
3.15.1*	50mm	150	RMT*											
3.15.2*	40mm	100	RMT*											
3.16	Monsoon reheating / winter heating kit comprising strip heaters, safety controls, air-stat, contactors, frame work, thermostat & humidistat/ sensors etc.	1	LOT											
3.17	Pan type humidifier for each AHU room complete with humidistat, safety controls, make up water piping from make up tank / nearest source of water, valves fittings etc	1	LOT											
3.18.1*	Fire damper with sleeve, auto resetting, limit switches, indication lamps etc	15	SQM*											
3.18.2*	Motorized actuator with control panel with single phase power supply for the above fire damper.	25	NO*											


 Chandrasekhar
 Planner (office)


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 S. A. Kumar

AC SYSTEM FOR 2x500 MW NEW NEYVELLI TPP (TG PACKAGE) --- SUGGESTIVE PRICE FORMAT														
SL No	DESCRIPTION OF EQUIPMENT/ ITEM	QTY	UNIT	SUPPLY						ERECTION AND COMMISSIONING				TOTAL
				Unit Price (Rs)	Total ex-works price (Rs)	ED (IncCESS) (Rs)	CST / VAT (Rs)	Freight (Including service tax, if applicable) (Rs)	TOTAL FOR site price SUPPLY (Rs)	Unit Price (Rs)	Total price (Rs)	Service Tax (Rs)	TOTAL PRICE (Erection and commissioning including Service tax)	Total Price Supply FOR site and E&C including service tax (Rs)
3.19*	GSS zinc coating 275 gms/ m ² ducting complete with hangers/ supports, dampers, grilles, diffusers (with & without VCD) etc.													
3.19.1*	18G.	800	SQM*											
3.19.2*	20G.	3800	SQM*											
3.19.3*	22G.	4200	SQM*											
3.19.4*	24G.	5000	SQM*											
3.20*	SUPPLY AIR DIFFUSERS / GRILLS with VCD (Extruded Aluminium powder coated) complete with fixing frames, nuts, bolts, gaskets, washers etc	80	SQM*											
3.21*	RETURN AIR DIFFUSERS / GRILLS without VCD (Extruded Aluminium powder coated) complete with fixing frames, nuts, bolts, gaskets, washers etc	80	SQM*											
3.22*	VOLUME CONTROL DAMPERS in GI construction as per specifications for supply / return ducts complete with fixing arrangement.	20	SQM*											
3.23	ACOUSTIC INSULATION of ducting from AHU outlets with material and finish as per specifications	1	LOT											
3.24*	THERMAL INSULATION of supply air duct & return air duct with material and finish as per specifications.	11800	SQM*											
3.25	FRESH AIR FANS (axial flow type), complete with motor, inlet cone, air filters (pre and fine), dampers, etc.	1	LOT											
3.26*	FAN COIL UNIT consisting of chilled water cooling coil, blower, motor, drive set, filters (pre filter), 3 way motorised mixing valve with thermostatic controls and other accessories.													
3.26.1*	3.0 TR	2	No*											
3.26.2*	2.0 TR	2	No*											
3.26.3*	1.5 TR	2	No*											
4.0	PLC based control panel complete for for the complete AC System including ACP 1 & 2 with all controls, interlocks, including the local control panels as required for individual AHU rooms for control of PU, Heater, Fire Dampers, special cable etc as specified.	1	LOT											
4.1	FIELD INSTRUMENTS like pressure gauge, temperature gauge, pressure switch, differential pressure switch, flow switch, flow meter, and other instrument required for control etc.	1	LOT											
4.2*	Optical fiber cable	100	RMT*											


 Chandrasekhar
 S A Officer

 S A Officer

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AC SYSTEM FOR 2x500 MW NEW NEYVELLI TPP (TG PACKAGE) --- SUGGESTIVE PRICE FORMAT														
SL No	DESCRIPTION OF EQUIPMENT/ ITEM	QTY	UNIT	SUPPLY						ERECTION AND COMMISSIONING				TOTAL
				Unit Price (Rs)	Total ex-works price (Rs)	ED (IncCESS) (Rs)	CST / VAT (Rs)	Freight (Including service tax, if applicable) (Rs)	TOTAL FOR site price SUPPLY (Rs)	Unit Price (Rs)	Total price (Rs)	Service Tax (Rs)	TOTAL PRICE (Erection and commissioning including Service tax)	Total Price Supply FOR site and E&C including service tax (Rs)
5.00	Air conditioning system for aux control rooms as specified.													
5.1*	AIR COOLED PACKAGE UNITS consisting of compressor, air cooled condenser, evaporator with blower and motor, expansion valve, filters, complete refrigerant piping between indoor and outdoor units & fittings with insulation etc.													
5.1.1*	15.0 TR capacity.	1	NO*											
5.1.2*	10.0 TR capacity.	1	NO*											
5.1.3*	7.5 TR capacity.	1	NO*											
5.2*	AIR COOLED SPLIT UNITS consisting of outdoor unit (having compressor condenser coils with fan and motor), indoor unit (having evaporator coil, filter,fan with motor), interconnecting refrigerant piping as per site requirement & fittings with insulation, cordless remote, electrical power cord upto the nearest available point along with isolator / MCB, fixing frame for indoor and outdoor unit, Stabilizer,etc. (BEE Rating 5 Star)													
5.2.1*	5.0 TR capacity (ductable type, 415 V, 3 phase with isolation switch).	2	NO*											
5.2.2*	3.0 TR capacity (ductable type, 415 V, 3 phase with isolation switch).	1	NO*											
5.2.3*	2.0 TR capacity (non-ductable type, 240 V, 1 phase isolation switch) with isolation switch , i.e MCB of suitable rating as specified.	15	NO*											
5.2.4*	1.5 TR capacity (non-ductable type, 240 V, 1 phase isolation switch) with isolation switch , i.e MCB of suitable rating as specified.	35	NO*											
6.0*	Manually operated, platform trolley of 1 Ton capacity with base area 2m x 1.5m	3	NO*											


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 S A Kolar
 Planner (office)

AC SYSTEM FOR 2x500 MW NEW NEYVELLI TPP (TG PACKAGE) --- SUGGESTIVE PRICE FORMAT														
SL No	DESCRIPTION OF EQUIPMENT/ ITEM	QTY	UNIT	SUPPLY						ERECTION AND COMMISSIONING				TOTAL
				Unit Price (Rs)	Total ex-works price (Rs)	ED (IncCESS) (Rs)	CST / VAT (Rs)	Freight (Including service tax, if applicable) (Rs)	TOTAL FOR site price SUPPLY (Rs)	Unit Price (Rs)	Total price (Rs)	Service Tax (Rs)	TOTAL PRICE (Erection and commissioning including Service tax)	Total Price Supply FOR site and E&C including service tax (Rs)
7.0*	Air curtain	8	NO*											
8.0	Total lumpsum price for commissioning spares inclusive of packing forwarding, transportation up to site, etc. (Bidder shall submit item-wise price break-up).	1	LOT											
9.0	Total lumpsum price for special tools & tackles for maintenance inclusive of packing forwarding, transportation up to site, etc. (Bidder shall submit item-wise price break-up).	1	LOT											
10.0	Total lumpsum price for Mandatory Spare for air conditioning inclusive of packing forwarding, transportation up to site, etc. (Bidder to submit item-wise price break-up seperately).	1	LOT											
11.0	Any other item not indicated above, but required to make the system complete in all respects.	1	LOT											

NOTES

- 1 The bidder shall furnish unit rates for variable item (marked *) for necessary adjustment (plus or minus) variation during detailed engg. stage. The unit rates quoted above shall be considered and no separate unit rates shall be quoted. Unit rates shall be valid throughout the contract.
- 2 Bidder must submit prices in the Pro Forma duly filled in signed and stamped on every page without any ambiguity. The price shall be written against each item. Term such as "refer covering letter" etc. are not acceptable. Extra sheet may be attached if the space provided is not sufficient
- 4 Items like drain piping with insulation, Duct work with accessories, insulation etc are common for all the AC plants
- 5 Price format shall not be changed by the bidder as the bidder may get disqualified by doing so.
- 6 For limitation on payment, percentages of individual items/equipments, as specified in the appendix-A1 shall be applicable


 S. A. K. K. S.
 S. A. K. K. S.
 S. A. K. K. S.

MANDATORY SPARE LIST - 2 x 500 MW NEW NWYVELI TG PACKAGE										
SL No	DESCRIPTION OF EQUIPMENT/ ITEM	SUPPLY								
		UNIT	QUANTITY	Unit Price (Rs)	Total ex-works price (Rs)	ED including CESS (Rs)	CST / VAT (Rs)	FREIGHT including Service Tax, If applicable (Rs)	TOTAL F.O.R. Site Price Supply (Rs)	REMARKS
1	Humidistat	No	2							Applicable items considered. Applicable items are those which are installed in the system.
2	Pr. Gauge of each type and range	%	5							
3	Temperature gauge of each type and range	%	5							
4	Level switches of each type and range	No	2							
5	Solenoid valves of each type and range	No	2							
6	Flow meter of each type and range	No	2							
7	Flow Switch of each type	No	2							
8	Thermostat of each type	No	2							
9	PLC cards (i.e. all types of cards/modules of PLC including CPU, power supply modules, interface modules, converter modules, I/O modules, relays, MCBs, fuses, terminal blocks, converters etc.)	%	10							
9.1	Power supply unit of each type	%	10							
9.2	Graphic Interface Unit for each type	No	1							
9.3	Cooling Fan in PLC system/Cabinet	No	2							
9.4	TFT Monitor for each type & size	No	1							
9.5	Printer for each type	No	1							


 S. A. Khan
 Project Officer


 S. A. Khan
 Project Officer


 S. A. Khan
 Project Officer

AC SYSTEM FOR 2x500 MW NEW NEYVELLI TPP (SG PACKAGE) --- SUGGESTIVE PRICE FORMAT														
SL No	DESCRIPTION OF EQUIPMENT/ ITEM	QTY	UNIT	SUPPLY						ERECTION AND COMMISSIONING				TOTAL
				Unit Price (Rs)	Total ex-works price (Rs)	ED (Inc CESS) (Rs)	CST / VAT (Rs)	Freight (Including service tax, if applicable) (Rs)	TOTAL FOR site price SUPPLY (Rs)	Unit Price (Rs)	Total price (Rs)	Service Tax (Rs)	TOTAL PRICE (Erection and commissioning including Service tax)	Total Price Supply FOR site and E&C including service tax (Rs)
1.0	LUMPSUM PRICES													
1.1	Total lumpsum firm prices for equipment & Services as specified, Comprising Engineering, design, manufacture, inspection & Testing at manufacturers works/subvendor's work, Painting at manufactures works, duty packed for transportation, delivery to site, unloading storage & handling at site, erection & commissioning, carrying out acceptance tests at site, final painting and handing over to customer the complete AC system on turnkey basis for 2X500 MW NNTPP as per specification PE-TS-400 & 402-553-A001 including special tool & tacksels for maintenance, commissioning spares, all taxes, duties etc.													
2.0	Break up prices for items covered in clause 1.0 above. In case, price indicated above does not match with item wise break-up given at 2.0, the highest price so calculated shall be considered for evaluation but in case of order, the same shall be placed at lowest price.													
3.0	AC plant -1 (Main control room areas in ESP building 1 & 2)													
3.1	Water chilling packages , each of minimum 100 TR capacity consisting of Screw chiller refrigerant compressor complete with motors, control panel, multi drive set, controls and interlocks other accessories as specified, Water cooled condenser adequately sized & other accessories and Shell & tube type water chiller & other accessories, as specified.	2	No											
3.2	Sheet metal cabinet type air handling units (double skin as per specification) consisting of chilled water cooling coil, centrifugal blower, TEFC sq cage induction motor, drive set, filters (pre filter and fine filters), 3 way motorised mixing valve with thermostatic controls and other accessories to meet AC load of control room areas at ESP-1 and ESP-2 building .	1	LOT											
3.3	Fibreglass reinforced plastic (FRP) construction cooling towers complete with fan, motor, FRP basin, nozzles, make up water & quick fill water connection, level witch, drains, piping, valves, strainers, ladder & all accessories as specified.	2	No											
3.4	Centrifugal pump sets for condenser water recirculation complete with TEFC motor & all accessories as specified.	2	No											


 S. A. Kumar
 Project Officer

AC SYSTEM FOR 2x500 MW NEW NEYVELLI TPP (SG PACKAGE) --- SUGGESTIVE PRICE FORMAT														
SL No	DESCRIPTION OF EQUIPMENT/ ITEM	QTY	UNIT	SUPPLY						ERECTION AND COMMISSIONING				TOTAL
				Unit Price (Rs)	Total ex-works price (Rs)	ED (Inc CESSION) (Rs)	CST / VAT (Rs)	Freight (Including service tax, if applicable) (Rs)	TOTAL FOR site price SUPPLY (Rs)	Unit Price (Rs)	Total price (Rs)	Service Tax (Rs)	TOTAL PRICE (Erection and commissioning including Service tax)	Total Price Supply FOR site and E&C including service tax (Rs)
3.5	Centrifugal pump sets for chilled water recirculation complete with TEFC motor & all accessories, as specified.	2	No											
3.6	HDPE / MS Make up Tank 2 cubm (Inner surface for MS Tank - spray galvanised). Make up water line with float valve & backup, quick fill line with ball valve, drain line with ball valve, overflow & vent line, level gauge shall be provided).	1	Nos											
3.7	HDPE / MS Storage Tank 8 cubm (Inner surface for MS Tank - spray galvanised). Make up water line with float valve & backup, quick fill line with ball valve, drain line with ball valve, overflow & vent line, level gauge shall be provided).	2	NO											
3.8	HDPE / MS chilled water Expansion Tank (Inner surface for MS Tank - spray galvanised) 1 cubm (insulated) with all accessories as required.	1	NO											
3.9	Water softening plant with pump set and all the accessories as required to meet system requirement.	2	NO											
3.10	CONDENSER WATER PIPING with necessary fittings like tees, reducers, expanders, elbows, flanges, all types of valves with flanges, strainers with flanges, air vents etc as per specifications. This item shall cover the entire condenser water piping (pipe, valves, strainers and all supporting accessories) for the entire Job.	1	LOT											
3.11	INSULATED CHILLED WATER PIPING with necessary fittings like tees, reducers, expanders, elbows, flanges, all types of valves with flanges, strainers with flanges, air vents etc as per specifications. This item shall cover the entire chilled water piping for all AC plants except for main chilled water pipe header from main AC plant upto ESP building AHU room.	1	LOT											
3.12	Monsoon reheating / winter heating kit comprising strip heaters, safety controls, air-stat, contactors, frame work, thermostat & humidistat/sensors etc.	1	LOT											
3.13	Pan type humidifier for each AHU room complete with humidistat, safety controls, make up water piping from make up tank / nearest source of water, valves fittings etc	1	LOT											


 S. A. K. Srinivas
 Project Officer


 S. A. K. Srinivas
 Project Officer

AC SYSTEM FOR 2x500 MW NEW NEYVELLI TPP (SG PACKAGE) --- SUGGESTIVE PRICE FORMAT														
SL No	DESCRIPTION OF EQUIPMENT/ ITEM	QTY	UNIT	SUPPLY						ERECTION AND COMMISSIONING				TOTAL
				Unit Price (Rs)	Total ex-works price (Rs)	ED (IncCESS) (Rs)	CST / VAT (Rs)	Freight (Including service tax, if applicable) (Rs)	TOTAL FOR site price SUPPLY (Rs)	Unit Price (Rs)	Total price (Rs)	Service Tax (Rs)	TOTAL PRICE (Erection and commissioning including Service tax)	Total Price Supply FOR site and E&C including service tax (Rs)
3.14	MS medium class DRAIN WATER PIPING from various equipment like cooling tower (including equalising line), condenser water pumps, AHU, FCU, Chilled water pump etc upto nearest available drain point with necessary fittings like tees, reducers, expanders, elbows, flanges, valves with flanges, P trap etc as per specifications. Piping serving chilled water shall be insulated as per specification , whereas piping serving condenser water shall be uninsulated.													
3.14.1*	50mm	100	RMT*											
3.14.2*	40mm	50	RMT*											
3.15.1*	Fire damper with sleeve, auto resetting, limit switches, indication lamps etc	10	SQM*											
3.15.2*	Motorized actuator with control panel with single phase power supply for the above fire damper.	12	NO*											
3.16*	GSS zinc coating 275 gms/ m ² ducting complete with hangers/ supports, dampers, grilles, diffusers (with & without VCD) etc.													
3.16.1*	18G.	200	SQM*											
3.16.2*	20G.	200	SQM*											
3.16.3*	22G.	300	SQM*											
3.16.4*	24G.	1000	SQM*											
3.17*	SUPPLY AIR DIFFUSERS / GRILLS with VCD (Extruded Aluminium powder coated) complete with fixing frames, nuts, bolts, gaskets, washers etc	10	SQM*											
3.18*	RETURN AIR DIFFUSERS / GRILLS without VCD (Extruded Aluminium powder coated) complete with fixing frames, nuts, bolts, gaskets, washers etc	10	SQM*											
3.19*	VOLUME CONTROL DAMPERS in GI construction as per specifications for supply / return ducts complete with fixing arrangement.	5	SQM*											
3.20	ACOUSTIC INSULATION of of ducting from AHU outlets with material and finish as per specifications	1	LOT											
3.21*	THERMAL INSULATION of supply air duct & return air duct with material and finish as per specifications.	1200	SQM*											
3.22	FRESH AIR FANS (axial flow type), complete with motor, inlet cone, air filters (pre and fine), dampers, etc.	1	LOT											
4	FIELD INSTRUMENTS like pressure gauge, temperature gauge, pressure switch, differential pressure switch, flow switch, flow meter, and other instrument required for control etc.	1	LOT											


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 S. A. K. Iyer

AC SYSTEM FOR 2x500 MW NEW NEYVELLI TPP (SG PACKAGE) --- SUGGESTIVE PRICE FORMAT														
SL No	DESCRIPTION OF EQUIPMENT/ ITEM	QTY	UNIT	SUPPLY						ERECTION AND COMMISSIONING				TOTAL
				Unit Price (Rs)	Total ex-works price (Rs)	ED (IncCESS) (Rs)	CST / VAT (Rs)	Freight (Including service tax, if applicable) (Rs)	TOTAL FOR site price SUPPLY (Rs)	Unit Price (Rs)	Total price (Rs)	Service Tax (Rs)	TOTAL PRICE (Erection and commissioning including Service tax)	Total Price Supply FOR site and E&C including service tax (Rs)
5.00	Air conditioning system for aux control rooms as specified.													
5.1*	AIR COOLED SPLIT UNITS consisting of outdoor unit (having compressor condenser coils with fan and motor), indoor unit (having evaporator coil, filter,fan with motor), interconnecting refrigerant piping as per site requirement & fittings with insulation, cordless remote, electrical power cord upto the nearest available point along with isolator / MCB, fixing frame for indoor and outdoor unit, Stabilizer,etc. (BEE Rating 5 Star)													
5.1.1*	2.0 TR capacity (non-ductable type, 240 V, 1 phase isolation switch) with isolation switch , i.e MCB of suitable rating as specified.	5	NO*											
5.1.2*	1.5 TR capacity (non-ductable type, 240 V, 1 phase isolation switch) with isolation switch , i.e MCB of suitable rating as specified.	5	NO*											
6.0	Total lumpsum price for commissioning spares inclusive of packing forwarding, transportation up to site, etc. (Bidder shall submit item-wise price break-up).	1	LOT											
7.0	Total lumpsum price for special tools & tackles for maintenance inclusive of packing forwarding, transportation up to site, etc. (Bidder shall submit item-wise price break-up).	1	LOT											
8.0	Total lumpsum price for Mandatory Spare for air conditioning inclusive of packing forwarding, transportation up to site, etc. (Bidder to submit item-wise price break-up seperately).	1	LOT											
9.0	Any other item not indicated above, but required to make the system complete in all respects.	1	LOT											

NOTES

- The bidder shall furnish unit rates for variable item (marked *) for necessary adjustment (plus or minus) variation during detailed engg. stage. The unit rates quoted above shall be considered and no separate unit rates shall be quoted. Unit rates shall be valid throughout the contract.
- Bidder must submit prices in the Pro Forma duly filled in signed and stamped on every page without any ambiguity. The price shall be written against each item. Term such as "refer covering letter" etc. are not acceptable. Extra sheet may be attached if the space provided is not sufficient
- Items like drain piping with insulation, Duct work with accessories, insulation etc are common for all the AC plants
- Price format shall not be changed by the bidder as the bidder may get disqualified by doing so.
- For limitation on payment, percentages of individual items/equipments, as specified in the appendix-A2 shall be applicable


 Chandrasekhar
 S. A. Officer

 S. A. Officer

 S. A. Officer

MANDATORY SPARE LIST - 2 x 500 MW NEW NWVELI SG PACKAGE										
SL No	DESCRIPTION OF EQUIPMENT/ ITEM	SUPPLY								
		UNIT	QUANTITY	Unit Price (Rs)	Total ex-works price (Rs)	ED including CESS (Rs)	CST / VAT (Rs)	FREIGHT including Service Tax, If applicable (Rs)	TOTAL F.O.R. Site Price Supply (Rs)	REMARKS
1	Contractor (For each type and rating)	No.	Minimum 1 no. of each type							Applicable items considered. Applicable items are those which are installed in the system.
2	Over load relay (For each type and rating)	No.	2 no. of each type							
3	Relay/Timer (For each type and rating)	No.	3 no. of each type							
4	Fan motor (For each type and rating)	No.	30% of each rating							
5	Electronics cards (For each type and rating)	No.	20% of each rating							
6	Switch fuse unit/MCCB/ELCB (For each type and rating)	No.	2 no. of each rating							
7	Blower motor (For each type and rating)	No.	30% of each rating							
8	Pumps (For each type and size)									
8.1	Impeller (For each type and size)	No.	2							
8.2	Shafts (For each type and size)	No.	1							
8.3	Shaft sleeve (For each type and size)	Set	3							
8.4	Casing wear ring (For each type and size)	Set	6							
8.5	Impeller bearing (For each type and size)	Set	2							
8.6	Motor bearing (For each type and size)	Set	2							
8.7	Thrust bearing (For each type and size)	Set	2							
8.8	Radial bearing (For each type and size)	Set	2							
8.9	Gland packing (For each type and size)	Set	2							
8.1	Fasteners (For each type and size)	Set	1							
8.11	Complete coupling (pump & motor) (For each type and size)	Set	1							
8.12	Motor (For each type and rating)	No.	1							


 Chandrasekhar
 Project Officer


 S. A. Kumar
 S. A. Kumar


 S. A. Kumar
 S. A. Kumar

APPENDIX - A1
Percentage breakup for Air Conditioning Package
2x500 MW NEW NEYVELI TPP (TG PACKAGE)

SL NO	DESCRIPTION OF EQUIPMENT/ ITEM	Percentage of total price
1	Total lumpsum firm prices for equipment & Services as specified, Comprising Engineering, design, manufacture, inspection & Testing at manufacturers works/subvendor's work, Painting at manufactures works, duty packed for transportation, delivery to site, unloading storage & handling at site, erection & commissioning, carrying out acceptance tests at site, final painting and handing over to customer the complete AC system on turnkey basis for 2X500 MW NNTPP as per specification PE-TS-400 & 402-553-A001 including special tool & tackels for maintenance, commissioning spares, all taxes, duties etc.(Without mandatory spare Sr. No. 10 of suggestive price format)	100%
2.0	BREAK-UP OF PRICES GIVEN IN 1.0 ABOVE (To be used during contract execution for payment)	
2.1	Total lump sum firm price for EQUIPMENT (SUPPLY) for Engineering, design, manufacture, inspection & Testing at manufacturers works/subvendor's work, Painting at manufactures works, duly packed for transportation, delivery to site, unloading storage & handling at site, for the complete scope of supply of AC system as defined in the technical specification (PE-TS-400 & 402-554-A001) for 2X500 MW NNTPS including special tool & tackels for maintenance, commissioning spares, all taxes, duties etc..	80%
2.2	Erection & commissioning, carrying out acceptance tests at site, final painting and handing over to customer the complete AC system on turnkey basis as per specification PE-TS-400 & 402-554-A001 including all taxes, duties etc..	20%
3.0	Break-up (%) of prices given at SI No-2.1 above (To be used during contract execution for payment)	Percentage of total price of SI No 2.1 above
3.1	Water Chilling machines - VAM - (Item no 3.1 of Suggestive price format)	22.00%
3.2	Water Chilling machine - Centrifugal Chiller - (Item no 3.2 of Suggestive price format)	7.00%
3.3	Air handling units (Item Nos 3.3, 3.4 & 3.5 of Suggestive price format)	9.00%
3.4	Cooling Towers (Item Nos 3.6 of Suggestive price format)	3.00%
3.5	Pumps (Item Nos 3.7 & 3.8 of Suggestive price format)	1.50%
3.6	Tanks (Item Nos 3.9, 3.10 & 3.11 of Suggestive price format)	1.00%
3.7	Water treatment equipment (Item no 3.12 of Suggestive price format)	7.00%
3.8	Condenser water piping (Item no 3.13 of Suggestive price format)	3.50%
3.9	Chilled water piping (Item no 3.14 of Suggestive price format)	5.50%
3.10	Drain piping(Item no 3.15 of Suggestive price format)	0.50%
3.11	Heaters and humidifiers (Item no 3.16 & 3.17 of Suggestive price format)	0.50%
3.12	Fire Dampers (Item no 3.18.1 & 3.18.2 of Suggestive price format)	0.50%
3.13	GSS Duct work with airline accessories (Item no 3.19, 3.20, 3.21 & 3.22 of Suggestive price format)	15.00%
3.14	Acoustic insulation (Item no 3.23 of Suggestive price format)	0.50%
3.15	Thermal Insulation (Item no 3.24 of Suggestive price format)	5.50%
3.16	Fans (Item no 3.25 of Suggestive price format)	0.50%
3.17	Fan Coil units (Item no 3.26 of Suggestive price format)	0.50%
3.18	PLC and field instruments - (Item no 4.0, 4.1 and 4.2 of Suggestive price format)	10.00%
3.19	Air cooled Package units (Item no 5.1 of Suggestive price format)	1.00%
3.20	Air cooled ductable split units (Item no 5.2.1 & 5.2.2 of Suggestive price format)	0.50%
3.21	Air cooled non-ductable split units (Item no 5.2.3 & 5.2.4 of Suggestive price format)	4.00%
3.22	Manual trolley (Item no 6.0 of Suggestive price format)	0.05%
3.23	Air curtain	0.45%
3.24	Commissioning Spares, Tools tackels & any other item (Item no 8.0, 9.0 & 11.0 of Suggestive price format)	1.00%




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APPENDIX - A2
Percentage breakup for Air Conditioning Package
2x500 MW NEW NEYVELI TPP (SG PACKAGE)

SL NO	DESCRIPTION OF EQUIPMENT/ ITEM	Percentage of total price
1	Total lumpsum firm prices for equipment & Services as specified, Comprising Engineering, design, manufacture, inspection & Testing at manufacturers works/subvendor's work, Painting at manufactures works, duty packed for transportation, delivery to site, unloading storage & handling at site, erection & commissioning, carrying out acceptance tests at site, final painting and handing over to customer the complete AC system on turnkey basis for 2X500 MW NNTPP as per specification PE-TS-400 & 402-553-A001 including special tool & tackels for maintenance, commissioning spares, all taxes, duties etc.(Without mandatory spare Sr. No. 8 of suggestive price format)	100%
2.0	BREAK-UP OF PRICES GIVEN IN 1.0 ABOVE (To be used during contract execution for payment)	
2.1	Total lump sum firm price for EQUIPMENT (SUPPLY) for Engineering, design, manufacture, inspection & Testing at manufacturers works/subvendor's work, Painting at manufactures works, duly packed for transportation, delivery to site, unloading storage & handling at site, for the complete scope of supply of AC system as defined in the technical specification (PE-TS-400 & 402-554-A001) for 2X500 MW NNTPS including special tool & tackels for maintenance, commissioning spares, all taxes, duties etc..	80%
2.2	Erection & commissioning, carrying out acceptance tests at site, final painting and handing over to customer the complete AC system on turnkey basis as per specification PE-TS-400 & 402-554-A001 including all taxes, duties etc..	20%
3.0	Break-up (%) of prices given at SI No-2.1 above (To be used during contract execution for payment)	Percentage of total price of SL No 2.1 above
3.1	Water Chilling machine - Screw Chiller - (Item no 3.1 of Suggestive price format)	22.00%
3.2	Air handling units (Item Nos 3.2 of Suggestive price format)	5.00%
3.3	Cooling Towers (Item no 3.3 of Suggestive price format)	4.00%
3.4	Pumps (Item no 3.4 & 3.5 of Suggestive price format)	2.00%
3.5	Tanks (Item Nos 3.6, 3.7 & 3.8 of Suggestive price format)	4.00%
3.6	Water treatment equipment (Item no 3.9 of Suggestive price format)	15.00%
3.7	Condenser water piping (Item no 3.10 of Suggestive price format)	8.00%
3.8	Chilled water piping (Item no 3.11 of Suggestive price format)	10.00%
3.9	Heaters and humidifiers (Item no 3.12 & 3.13 of Suggestive price format)	1.00%
3.10	Drain piping(Item no 3.14 of Suggestive price format)	0.50%
3.11	Fire Dampers (Item no 3.15.1 & 3.15.2 of Suggestive price format)	1.50%
3.12	GSS Duct work with airline accessories (Item no 3.16, 3.17, 3.18 & 3.19 of Suggestive price format)	15.00%
3.13	Acoustic insulation (Item no 3.20 of Suggestive price format)	1.00%
3.14	Thermal Insulation (Item no 3.21 of Suggestive price format)	2.50%
3.15	Fans (Item no 3.22 of Suggestive price format)	1.00%
3.16	Field instruments - (Item no 4.0 of Suggestive price format)	2.00%
3.17	Air cooled non-ductable split units (Item no 5.1 of Suggestive price format)	4.00%
3.18	Commissioning Spares, Tools tackels & any other item (Item no 6.0, 7.0 & 9.0 of Suggestive price format)	1.50%



 Varun Jain S A Kolan Praveen Kishore

2X660 MW OPGCL
AIR CONDITIONING SYSTEM
GUARANTEED POWER CONSUMPTION FIGURES

S.NO.	DESCRIPTION OF EQUIPMENT	NO OF EQUIPMENT	TOTAL GUARANTEED POWER CONSUMPTION FOR EACH EQUIPMENT AT MOTOR INPUT TERMINAL AND CONTROL PANEL (IN KW)	DUTY FACTOR	TOTAL KW
		WORKING			
		3A	4	5	6=3Ax4x5
1	AC PLANT-1				
1.1	Refrigerant pump, solution pump, control panel etc. for VAM package	2		1	
1.2	Chilled water pumps for AC plant	2		1	
1.3	Condenser water pumps for AC plant	2		1	
1.4	Cooling tower fans for AC plant	2		1	
1.5	AHUs for Common control room area at EL 17 m.	2		1	
1.6	AHUs for Common control room area at EL 8.5 m.	1		1	
1.7	AHUs for service bld.	lot		1	
2	AC PLANT-2				
2.1	Screw chiller	1		1	
2.2	FRP Cooling Tower	1		1	
2.3	Chilled water pumps	1		1	
2.4	Condenser water pumps	1		1	
2.5	AHUs for ESP control room-1	lot		1	
2.6	AHUs for ESP control room-2	lot		1	
TOTAL (KW)					405.5



Note:	Estimated power consumption (EPC) figure at motor input terminals (not shaft power) for the system (for working drives only) shall not be more than 405.5 KW .
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