

TENDER SPECIFICATION

BHEL: PSSR: SCT: 1466

FOR

Pre-bid tie up on back to back basis for
Civil, Structural & Balance of Plant for 1x
700 MW Combined Cycle Power Plant of
Andhra Pradesh Power Development
Company Limited

at

Nedunoor, Karimnagar Dist, AP

**TECHNOCOMMERCIAL BID-
VOLUME-K -SCHEDULES**



BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)

Power Sector – Southern Region

690, Anna Salai, Nandanam, Chennai – 600 035.

**BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
Power Sector, Southern Region
690, Anna Salai, Nandanam, Chennai – 35**

Tender Specification No. BHEL: PSSR: SCT: 1466

For

Pre-bid tie up on back to back basis for Civil, Structural & Balance of Plant for 1x700 MW Combined Cycle Power Plant of Andhra Pradesh Power Development Company Limited (APPDCL) at Nedunoor, Karimnagar Dist, AP

One set of Tender documents consisting of **Volume - A to Volume- L** (details as below)

BOOK SLNO _____

Issued to

M/s

Refer NIT for Last date of submission

Please note this tender document is not transferable

For and on behalf of
BHARAT HEAVY ELECTRICALS LIMITED

ADDL GENERAL MANAGER / CONTRACTS

Place: Chennai -35

Tender Specification BHEL PSSR SCT 1466 comprise of Volume-A to Volume -L as below:

Sl no of Volumes	Description	No. of pages (including drawings)	Remarks
BHEL Vol -A	NIT		
BHEL Vol -B	Project information, schedules, QA, Other requirements		
	Scope TP, Exclusions		
	Proposed scope split of Electrical between BHEL & EPC contractor		
	Scope split BHEL & EPC contractor dt 29-06-2011		
	Scope of lifting equipments		
BHEL Vol -C	SCC- BHEL		
BHEL Vol -D	Consolidated GCC- BHEL-PEM		
	APPDCL Volume -1,SECTION A1 TO A4		
BHEL Vol -E	Geo tech investigations		
	Tech requirements for General Civil works		
	Additional civil drgs		
BHEL Vol -F	Scope of Cooling tower		
BHEL Vol -G	Tech requirements for General Electrical works		
BHEL Vol -H	Technical spec for Mechanical packages- Bought out packages		
BHEL Vol -I	NOT APPLICABLE		
BHEL Vol -J	Amendments & clarifications		
BHEL Vol -K	Schedules		
BHEL Vol -L	Price schedule		



SCHEDULES

VOLUME -K

Bharat Heavy Electricals Limited



	ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION F-1
	TITLE 1X700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.	SHEET 1 OF 1
	SCHEDULE OF BIDDER'S EXPERIENCE	SPEC NO. TCE.5960A-H-500-001

The Bidder shall furnish herewith a list of similar jobs executed by him to whom reference may be made by the Owner in case the Owner considers such a reference necessary, particularly those projects referred herein meeting the Bidder's Qualification Requirement, shall be listed separately at the beginning of the list and shall also be highlighted.

Sl. No.	Name and Description of Work	Value of Client Work	Purchase order No. & Date	Period of execution from LOI to handing over and date of commissioning	Persons to whom reference may be made
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Note : Bidders shall furnish copies of testimonials from atleast two clients.

SIGNATURE _____

NAME _____

COMPANY SEAL DESIGNATION _____

COMPANY _____

DATE _____

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ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.

SECTION: F2

TITLE

1X700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.

SHEET 3 OF 11

SCHEDULE OF PERFORMANCE GUARANTEE

SPEC. NO.
TCE.5960A-H-500-001

Sl. No.	Particulars	Units	Value indicated inclusive of design, manufacture, measurement and all other tolerances, with gas turbines firing Natural gas as fuel	Applicable Test Codes
B	<u>PERFORMANCE GUARANTEES</u>			
3.0	<u>UNDER CORRECTION</u>			

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ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.

SECTION: F2

TITLE

1X700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.

SHEET 4 OF 11

SCHEDULE OF PERFORMANCE GUARANTEE

SPEC. NO.
TCE.5960A-H-500-001

Sl. No.	Particulars	Units	Value indicated inclusive of design, manufacture, measurement and all other tolerances, with gas turbines firing Natural gas as fuel	Applicable Test Codes
3.3	The cooling tower capability			

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ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.

SECTION: F2

TITLE

1X700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.

SHEET 7 OF 11

SCHEDULE OF PERFORMANCE GUARANTEE

SPEC. NO.
TCE.5960A-H-500-001

Sl. No.	Particulars	Units	Value indicated inclusive of design, manufacture, measurement and all other tolerances, with gas turbines firing Natural gas as fuel	Applicable Test Codes
3.9.3	Vibration levels of all other equipment and system over the complete range of operation as per specified values		Yes / No	
3.9.4	Quality of Effluents discharged	APPDCL requirements	Yes / No	
3.10	<u>Noise Level over the Complete Range of Operation at 1.0 m from the Surface of</u>			

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Sl. No.	Particulars	Units	Value indicated inclusive of design, manufacture, measurement and all other tolerances, with gas turbines firing Natural gas as fuel	Applicable Test Codes	
	(g) All other auxiliaries	dBA			
	(h) Main control building, administration building, various laboratories	dBA			
	(m) Air compressor building				
	(n) Equipment of all other systems	dBA			
3.11	Noise level over the complete range of operation at plant boundary excluding the colony.				
	(a) During day time	dBA			
	(b) During night time	dBA			
3.13	<u>Balance of Plant as per guarantee parameters of equipment / system under correction. (Specific details of shop and site tests shall be furnished)</u>			Performance Tests	
				Shop Tests	Site Tests

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ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.

SECTION: F2

TITLE

1X700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.

SHEET 9 OF 11

SCHEDULE OF PERFORMANCE GUARANTEE

SPEC. NO.
TCE.5960A-H-500-001

Sl. No.	Particulars	Units	Value indicated inclusive of design, manufacture, measurement and all other tolerances, with gas turbines firing Natural gas as fuel	Applicable Test Codes	
				Shop Tests	Site Tests
3.13.2	CW system				
	(a) Induced draft cooling tower			Yes / No	Yes / No
3.13.3	Fire fighting system			Yes / No	Yes / No
3.13.4	Air conditioning and ventilation system			Yes / No	Yes / No
3.13.6	EOT Cranes			Yes / No	Yes / No
3.13.8	Air compressor			Yes / No	Yes / No
3.13.9	Electrical system as per Quality Assurance Program			Yes / No	Yes / No
3.13.10	I&C systems				
	(a) Factory Acceptance Test DCS and other SWAS systems			Yes / No	Yes / No
	(d) Other items as per quality assurance programme			Yes / No	Yes / No
3.13.12	Auxiliary power consumption for all individual equipment at site			Yes / No	Yes / No

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ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.

SECTION: F2
SHEET 11 OF 11

TITLE

1X700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.

SPEC. NO.
TCE.5960A-H-500-001

SCHEDULE OF PERFORMANCE GUARANTEE

SEAL OF COMPANY

SIGNATURE _____

NAME _____

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SCHEDULE OF AUXILIARY POWER CONSUMPTION

TABLE – B : OTHER CONTINUOUSLY OPERATING EQUIPMENT / SYSTEM

Sl. No.	Particulars	Number operating for Combined Cycle Power Plant	Total number provided (Operating + Standby) for Combined Cycle Power Plant	Total Power consumption for entire Combined Cycle Power Plant in kW
(1)	(2)	(3)	(4)	(5)
1.0	<u>Water system</u>			
1.6	Other miscellaneous pumps			
3.0	<u>Electrical system losses</u>	-	-	
3.3	Transformers			
3.4	Switchgear			
3.5	Cable			
	Any other			

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SCHEDULE OF AUXILIARY POWER CONSUMPTION

Sl. No.	Particulars	Number operating for Combined Cycle Power Plant	Total number provided (Operating + Standby) for Combined Cycle Power Plant	Total Power consumption for entire Combined Cycle Power Plant in kW
(1)	(2)	(3)	(4)	(5)
4.0	Instrumentation and Control system			
4.2	Others			
5.0	<u>Other items</u>			
5.1				
5.2				
5.3				
5.4				
6.0	Sub-sub total auxiliary power consumption	kW	(Adding all items of column (5))	

NOTE:

BIDDER shall furnish necessary calculations and characteristic curves / assumptions used, as Annexure to this Schedule

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TABLE – C: BALANCE OF PLANT

Sl. No	Particulars *1	Type of operation Continuou s / Intermitten t	Number of hours of operation per day in case of intermittent operation	Total Power consumption in kW when system / plant of entire combined cycle power plant, are operated at guarantee condition
(1)	(2)	(3)	(4)	(5)
1.0	Pre-treatment plant, Filtration plant and DM plant			
2.0	Effluent treatment plant			
4.0	Air conditioning system at guarantee ambient condition			
5.0	Ventilation systems at guarantee ambient condition			
6.0	Instrument and Service air system			
7.0	Plant computer network (total)			
8.0	Plant lighting (total)			

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TABLE – C (CONTD.)

Sl. No.	Particulars *1	Type of operation Continuou s / Intermitt t	Number of hours of operation per day in case of intermittent operation	Total Power consumption in kW when system / plant of entire combined cycle power plant, are operated at guarantee condition
(1)	(2)	(3)	(4)	(5)
9.0	<u>Any other items</u>			
9.1				
9.2				
9.3				
9.4				
10.0	Sub-sub total auxiliary power consumption	KW	Sum of column{ (4) x (5) } / 24	

NOTE: *1: Contractor shall detail the list of consumers under the above major headings

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TABLE – D**ANY OTHER SYSTEM NOT COVERED ABOVE BUT NEEDS CONTINUOUS RUNNING**

Sl. No	Particulars *1	Type of operation Continuou s / Intermitt t	Number of hours of operation per day in case of intermittent operation	Total Power consumption in kW when system / plant of entire combined cycle power plant, are operated at guarantee condition
(1)	(2)	(3)	(4)	(5)
1.0	(a)			
	(b)			
	(c)			
	(d)			
2.0	Sub-total auxiliary power consumption	KW	Sum of column{ (4) x (5) } / 24	

Total auxiliary power consumption to be guaranteed in Schedule – F2 for the entire combined cycle power plant shall be arrived using the following formula

:

{ Item 3.0 of Table - A + Item 6.0 of Table - B + Item 10.0 of Table - C + Item 2.0 of table - D } / 1000, MW

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ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.

SECTION: F4

TITLE

SHEET 1 OF 1

1X700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.

SPEC. NO.
TCE.5960A-H-500-001

SCHEDULE OF DEVIATIONS FROM TECHNICAL SPECIFICATION

All deviations from the Technical Specification TCE.5960A-H-500-001 shall be filled in by the BIDDER clause by clause in this schedule.

SECTION	CLAUSE NO.	DEVIATION WITH CLARIFICATION	COST FOR WITHDRAWING THE DEVIATION

The BIDDER hereby certifies that the above mentioned are the only deviations from the OWNER's Technical Specifications for this enquiry. The BIDDER further confirms that in the event any other data and information presented in the BIDDER's proposal and accompanying documents including drawings, catalogues, etc., are at variance with the specific requirements laid out in the OWNER's Technical Specifications, then the latter shall govern and will be binding on the BIDDER for the quoted price.

SEAL OF COMPANY

SIGNATURE

NAME

DESIGNATION

COMPANY

ADDRESS

DATE

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ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.		SECTION : F6	
TITLE		SHEET 37 of 100	
700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – MECHANICAL SYSTEMS		SPEC NO. TCE. 5960A-H-500-001	
SL. NO	ITEM	UNITS	BIDDER TO INDICATE
6.0	<u>CONDENSATE STORAGE AND MAKE-UP WATER SYSTEM</u>		
6.1	<u>Storage Tanks</u>		<u>DM Water</u> <u>CST</u>
	(a) Number		
	(b) Capacity of each tank	m ³	
	(c) Material of construction		
	(d) Painting – External/Internal		
	(e) PVC floating balls provided		
	(f) Carbon-di-oxide absorber provided		
	(g) Diameter/height of tank	m X m	
7.0	<u>COOLING TOWER</u>		
7.1	<u>Cooling Tower</u>		
7.1.1	<u>Performance parameters</u>		
	(a) Total design capacity	m ³ /hr	
	(b) Hot water inlet temp	°C	
	(c) Recooled water temp.	°C	
	(d) Design inlet wet bulb temp.	°C	
	(e) Design Approach	°C	
	(f) Wind velocity for performance	m/sec.	
	(g) Pumping head (above normal working water level in the basin)	m/c	
	(h) Dry air flow	kg/hr	
NOTE TO BIDDER		SIGNATURE	
1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK(*) (DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS)		OF BIDDER	ISSUE
2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.		DATE	R0

		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6	
		TITLE	SHEET 38 of 100	
		700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – MECHANICAL SYSTEMS	SPEC NO. TCE. 5960A-H-500-001	
SL. NO	ITEM	UNITS	BIDDER TO INDICATE	
7.1.2	(i) Temp. of air leaving the tower	^o C		
	(j) Drift loss per tower	m ³ /hr		
	(k) Evaporation loss per tower	m ³ /hr		
	(l) Recommended blowdown for tower	m ³ /hr		
	(m) cooling water flow per unit fill area	kg/m ²		
	(L)			
	(n) Ratio of water to air by weight	m ³		
	(L/G)			
	(O) Active tower volume (fill volume)			
	(p) Tower coefficient (KaV/L)			
	(2) Fan data:	kW		
		%		
	(a) Power input to each fan motor	%		
	(b) Fan efficiency	%		
	(c) Gear box efficiency	%		
	(d) Efficiency of motor	kW		
	(e) Static efficiency of fan			
	(f) Recommended motor rating			
	<u>Construction Features</u>			
	(a) Type of tower	Induced draft		
(b) Type of air inlet				
(c) Type of fill arrangement				
(d) Total height of fill arrangement	m			
(e) Surface area of fill	m ²			
(f) Type of drift eliminators				
(g) <u>Material of construction</u>				
(i) Fill				
(ii) Fill Support				
(iii) Internal supporting Structures				
(iv) Drift Eliminators and its supports				
(h) <u>Overall dimensions</u>				
(i) Width	m			
(ii) Length	m			
(iii) Height	m			
(i) <u>Inside Basin dimensions</u>				
(i) Width	m			
(ii) Length	m			
NOTE TO BIDDER		SIGNATURE		
1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK(*) (DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS)		OF BIDDER	ISSUE	
2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.		DATE	R0	

		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.		SECTION : F6	
		TITLE		SHEET 42 of 100	
		700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – MECHANICAL SYSTEMS		SPEC NO. TCE. 5960A-H-500-001	
SL. NO	ITEM	UNITS	BIDDER TO INDICATE		
7.4.4	Miscellaneous accessories (a) <u>Chlorine Leak Detector</u> (i) No. offered/make (b) <u>Chlorine Residual Analyser</u> (i) No. offered/make				
7.6	Miscellaneous Pumps (Horizontal Centrifugal Pumps - Data to be furnished for each type of Pumps)				
7.6.1	(a) Designation (b) Number Offered (c) Design Capacity (d) Differential Head (e) Shut-Off Head (f) Number of Stages (g) Pump Efficiency at duty point (h) Pump Speed (i) Power Input to driver at duty point (j) NPSH Required (k) Driver Efficiency (l) Minimum Capacity for Continuous Operation (m) External Water Requirement for Sealing & Cooling	No. m ³ /hr mlc mlc % rpm kW mlc % m ³ /hr Reqd / Not Reqd			
NOTE TO BIDDER 1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK(*) (DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS) 2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.			SIGNATURE OF BIDDER DATE		ISSUE R0

	ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6
	TITLE	SHEET 43 of 100
	700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – MECHANICAL SYSTEMS	SPEC NO. TCE. 5960A-H-500-001

SL. NO	ITEM	UNITS	BIDDER TO INDICATE
7.7	(n) Motor rating	kW	
	<u>Raw Water Clarification Plant</u>		
	<u>Clarifier</u>		
	(a) Size of clarifier		
	(i) Clarification zone	Dia m & depth m	
	(ii) Flocculation zone	Dia m & depth m	
	(b) Surface flow rate		
	(c) Pressure drop (from inlet to stilling chamber upto outlet of clarifier including flow measuring devices)	M	
	(d) Sludge concentration	%	
	(e) Sludge volume	Cu.m	
	(f) Sludge feed pumps data		
	(i) Make	Cu.m/hr	
	(ii) Capacity & Head	m	
	(iii) Setting length	M	
	(iv) Motor make and rating		
	(g) Centrifuge data		
	(i) Make	m ³ /hr	
	(ii) Type	kW	
	(iii) Feed flow rate		
	(iv) Rating		
(h) Thickner			
(i) Size			
(ii) Feed flow rate			

NOTE TO BIDDER 1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK(*) (DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS) 2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.	SIGNATURE		
	OF BIDDER		ISSUE
	DATE		R0

		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6
		TITLE	SHEET 44 of 100
		700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – MECHANICAL SYSTEMS	SPEC NO. TCE. 5960A-H-500-001
SL. NO	ITEM	UNITS	BIDDER TO INDICATE
7.8	<u>Coagulant / polyelectrolyte dosing pump</u>		
	(a) Size of each tank		
	(b) Dosing pumps data		
	(i) Capacity	m ³ /hr	
	(ii) Discharge pressure	mWc	
	(iii) Motor make & rating		
8.0	<u>WATER TREATMENT PLANT</u>		
8.1	Cation Units		
8.1.1	Size of each unit (dia x HOS)	m x m	
8.1.2	Design flow rate (gross)	cu.m/hr	
8.1.3	Gross output between regenerations	cu.m	
8.1.4	Productive output between regenerations	cu.m	
8.1.5	Resin make and type		
8.1.6	Resin quantity per unit	lit	
8.1.7	Type of regeneration		
8.1.8	Regeneration level	kg/cu.m	
8.1.9	Derated exchange capacity	kg/cu.m	
8.1.10	Quantity of 30% HCl/ unit/ regeneration	cu.m	
8.2	Degasser Unit		
8.2.1	Size of each unit (dia c HOS)	m x m	
8.2.2	Design flow rate (gross)	cu.m/hr	
8.2.3	Size of degassed water tank (diaxHOS)	m x m	
8.2.4	Degassed water pumps		
	(a) Capacity / pump	cu.m /hr	
	(b) Head	mlc	
8.2.5	Degasser air blowers		
	(a) Capacity / blower	cu.m/min	
	(b) Discharge pressure	kg/sq.cm	
8.3	Anion Units		
8.3.1	Size of each unit (dia x HOS)	m x m	
8.3.2	Design flow rate (gross)	cu.m /hr	
8.3.3	Gross output between regenerations	cu.m/hr	
8.3.4	Productive output between Regenerations		
8.3.5	Resin make and type		
8.3.6	Resin quantity per unit	lit	
8.3.7	Type of regeneration		
NOTE TO BIDDER			
1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK(*) (DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS)		SIGNATURE	
2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.		OF BIDDER	ISSUE
		DATE	R0

		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6
		TITLE	SHEET 45 of 100
		700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – MECHANICAL SYSTEMS	SPEC NO. TCE. 5960A-H-500-001
SL. NO	ITEM	UNITS	BIDDER TO INDICATE
8.3.8	Regeneration level	kg/cu.m	
8.3.9	Deaerated exchange capacity	kg/cu.m	
8.3.10	Quantity of 48% NaOH/unit/regeneration	cu.m	
8.4	<u>Mixed Bed Units</u>		
8.4.1	Size of each unit (dia x HOS)	m x m	
8.4.2	Design flow rate (gross)	cu.m/hr	
8.4.3	Gross output between regenerations	cu.m	
8.4.4	Productive output between regenerations	cu.m	
8.4.5	Resin make and type		
	(a) Cation resin	lit	
	(b) Anion resin	lit	
8.4.6	Resin Quantity per unit		
	(a) Cation resin	lit	
	(b) Anion resin	lit	
8.4.7	Regeneration levels		
	(a) Cation resin	kg/cu.m	
	(b) Anion resin	kg/cu.m	
8.4.8	Derated exchange capacity		
	(a) Cation resin	kg/cu.m	
	(b) Anion resin	kg/cu.m	
8.4.9	Regenerant consumption		
	(a) Quantity of 30% HCl/unit/regeneration	cu.m	
	(b) Quantity of 48% NaOH/unit/regeneration	cu.m	
8.4.10	Mixed Bed Air Blowers		
	(a) Capacity per bower	cu.m/hr	
	(b) Discharge pressure	kg/cu.m	
8.5	<u>Acid Regeneration System</u>		
8.5.1	Size of bulk acid tank	m x m	
8.5.2	Acid transfer pumps		
NOTE TO BIDDER		SIGNATURE	
1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK(*) (DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS)		OF BIDDER	ISSUE
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		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6
		TITLE	SHEET 46 of 100
		700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – MECHANICAL SYSTEMS	SPEC NO. TCE. 5960A-H-500-001
SL. NO	ITEM	UNITS	BIDDER TO INDICATE
8.6	(a) Capacity per pump (b) Head <u>Alkali Regeneration System</u>	cu.m/hr kg/sq.cm	
8.6.1	Size of bulk acid tank	m x m	
8.6.2	Alkali transfer pumps data a) Capacity per pump b) Head	cu.m/hr kg/sq.cm	
8.7	<u>Neutralisation System</u>		
8.7.1	Capacity per pump	cu.m/hr	
8.7.2	Head	kg/sq.cm	
8.7.3	Pit dimensions		
8.8	<u>Control Panel</u>		
8.8.1	Make		
8.8.2	Dimensions		
8.9	<u>DM Plant Coagulant System</u>		
	a) Size of each tank		
	b) Dosing Pump Data		
	(i) Capacity	m ³ /hr	
	(ii) Discharge Pressure	mWc	
	(iii) Motor make & rating		
8.10	<u>Pressure Sand Filter</u>		
	(a) Size	Dia & Ht (m)	
	(b) Capacity	Cum / hr	
	(c) Surface flow rate	Cum / hr	
	(d) Storage Capacity of filter water storage tank	Cu m	
8.11	<u>Activated Carbon Filter</u>		
	(a) Size	Dia & Ht (m)	
	(b) Capacity	Cum / hr	
	(c) Surface flow rate	Cum / hr	
NOTE TO BIDDER		SIGNATURE	
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		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6
		TITLE	SHEET 47 of 100
		700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – MECHANICAL SYSTEMS	SPEC NO. TCE. 5960A-H-500-001
SL. NO	ITEM	UNITS	BIDDER TO INDICATE
8.12	<u>PLC</u>		
8.12.1	Make		
8.12.2	Model number/System type		
9.0	<u>FIRE PROTECTION SYSTEM</u>		
9.1	<u>Hydrant System</u>		
9.1.1	External hydrant		
	a) Single headed	(No./size)	
	b) Double Headed		
9.1.2	Internal hydrant	No.	
9.1.3	Water monitors	No.	
9.2.4	Hoses	No.	
9.2	<u>SPRAY SYSTEM</u>		
9.2.1	Max. Spray water demand for single largest transformers	m ³ /hr	
9.2.2	Max. Spray water demand for Cable gallery (for 3 zone operation)	m ³ /hr	
9.2.3	Max. Spray water for lube oil tanks	m ³ /hr	
9.2.4	Max. Spray water for Fuel oil tanks	m ³ /hr	
9.3	<u>Portable Extinguishers</u> Bidder to attach separate sheet indicating The type, capacity and quantity of extinguishers envisaged		
9.4	<u>Pumps</u> (Bidder to indicate separately for each type of pump)		
NOTE TO BIDDER		SIGNATURE	
1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK(*) (DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS)		OF BIDDER	ISSUE
2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.		DATE	R0

		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6
		TITLE	SHEET 48 of 100
		700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – MECHANICAL SYSTEMS	SPEC NO. TCE. 5960A-H-500-001
SL. NO	ITEM	UNITS	BIDDER TO INDICATE
9.4.1	Make / Model		YES/NO
9.4.2	Capacity / Head/ Quantity	m ³ /hr / m/ Nos.	
9.4.3	Speed	rpm	
9.4.4	Efficiency (pump and motor)	%	
9.4.5	Motor / Engine rating	kW	
9.5	<u>Mobile Fire Tender</u>		YES/NO
9.5.1	Quantity	No.	
9.5.2	Type and brief description		
9.6	<u>General</u>		YES/NO
	All System - As per TAC		
10.0	<u>EFFLUENT TREATMENT PLANT</u>		YES/NO
10.1	<u>Effluent Disposal Pumps</u>		
10.1.1	Capacity	m ³ /hr	
10.1.2	Total Head	m/c	
10.1.3	Speed – Maximum	rpm	
10.1.4	Material of construction		
10.2	<u>Chemical Dosing System</u>		
10.2.1	Size of each tank		
10.2.2	Dosing pumps data		
	(a) Capacity	m ³ /hr	
	(b) Discharge pressure	mWc	
	(c) Motor rating	kW	
10.3	<u>Oil Water Separator Plant</u>		
10.3.1	Oil content in effluent water of oil water separator plant	mg/l	
10.3.2	Type of oil – water separator offered		
10.3.3	Material of construction of separator and accessories		
10.3.4	Plan area required for oil water separator	m x m	
NOTE TO BIDDER			
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		DATE	R0

ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.		SECTION : F6
TITLE 700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – MECHANICAL SYSTEMS		SHEET 51 of 100
		SPEC NO. TCE. 5960A-H-500-001

SL. NO	<u>ITEM</u>	UNITS	BIDDER TO INDICATE
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13.0	<u>AIR CONDITIONING AND VENTILATION SYSTEM</u>		
13.1	<u>Chillers</u>		
13.1.1	No. of chiller units (operating + standby)		

NOTE TO BIDDER 1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK(*) (DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS) 2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.	SIGNATURE		
	OF BIDDER		ISSUE
	DATE		R0

		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6
		TITLE	SHEET 52 of 100
		700 MW CAPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – MECHANICAL SYSTEMS	SPEC NO. TCE. 5960A-H-500-001
SL. NO	ITEM	UNITS	BIDDER TO INDICATE
13.1.2	Capacity	TR	
13.1.3	Power Consumption for each chiller unit	kW	
13.1.4	Type of unit		
13.2	<u>Cooling Towers</u>		
13.2.1	Number (operating + standby)		
13.2.2	Type		
13.2.3	Capacity		
13.2.4	Make-up water requirement	m ³ /hr	
13.2.5	Power Consumption	kW	
13.3	<u>Chilled water pumps</u>		
13.3.1	Number (operating + standby)	No.	
13.3.2	Type		
13.3.3	Capacity	m ³ /hr	
13.3.4	Total head		
13.4	<u>Condenser cooling water pumps</u>		
13.4.1	Number (operating + standby)	No.	
13.4.2	Type		
13.4.3	Capacity	m ³ /hr	
13.4.4	Total head		
13.5	<u>Packaged Air – Conditioners</u>		
13.5.1	Number of packaged air conditioners for each building (operating + standby)	No.	
13.5.2	Capacity	TR	
13.5.3	Power Consumption of each packaged air conditioners	kW	
13.5.4	Air Flow Rate	Cu m / hr	
13.6	<u>Evaporative Cooling (Air Washer)</u>		
13.6.1	Number		
13.6.2	Capacity	Cu m / hr	
13.6.3	Saturation Efficiency	%	
13.6.4	No. of banks		
13.7	<u>Circulating water pumps for air washer unit</u>		
13.7.1	Number (operating + standby)	No.	
13.7.2	Type		
13.7.3	Capacity	m ³ /hr	
NOTE TO BIDDER		SIGNATURE	
1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK(*) (DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS)		OF BIDDER	ISSUE
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		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6	
		TITLE	SHEET 53 of 100	
		700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – MECHANICAL SYSTEMS	SPEC NO. TCE. 5960A-H-500-001	
SL. NO	ITEM	UNITS	BIDDER TO INDICATE	
13.7.4	Total head			
13.8	Centrifugal fans for air washer unit.			
13.8.1	Number			
13.8.2	Type			
13.8.3	Capacity			
13.8.4	Static pressure			
13.9	Basis of sizing the A/C system capacity for different areas as an annexure . Note: Bidder shall ensure that all the data are furnished for each building and for each type/ size of system/equipment.			
14.0	<u>CRANES & HOISTS</u>			
14.1	Turbine Building EOT Crane			
14.1.1	Capacity			
14.1.2	Span			
14.1.3	Lift			
14.1.4	Speed (a) Long travel (b) Cross travel (c) Hoisting			
14.1.5	Motor rating (a) Long travel (b) Cross travel (c) Hoisting			
14.2	<u>Other Miscellaneous Cranes & Hoists Provided</u> (indicate capacities and location) a) b)			
15.0	<u>AIR COMPRESSOR</u>			
15.1	Number of compressors			
15.2	Type of compressor			
NOTE TO BIDDER		SIGNATURE		
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2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.		DATE		R0

	ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6
	TITLE	SHEET 54 of 100
	700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – MECHANICAL SYSTEMS	SPEC NO. TCE. 5960A-H-500-001

SL. NO	<u>ITEM</u>	UNITS	BIDDER TO INDICATE
15.3	Rated capacity of compressor		
15.4	Compressor power requirements		
15.5	Discharge pressure of compressor		
15.6	Rated capacity of air drier		
16			

NOTE TO BIDDER 1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK(*) (DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS) 2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.	SIGNATURE		
	OF BIDDER		ISSUE
	DATE		R0

		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6
		TITLE	SHEET 78 of 100
		1 X700) MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – ELECTRICAL SYSTEMS	SPEC. NO. TCE.5960 A-H-500-001
SL. NO	<u>ITEM</u>	UNITS	BIDDER TO INDICATE
4.0	<u>Bus duct IPDB</u>		<u>Non Segregated PBD</u>
NOTE TO BIDDER		SIGNATURE	
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2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.		DATE	

		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6
		TITLE	SHEET 79 of 100
		1 X700) MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – ELECTRICAL SYSTEMS	SPEC. NO. TCE.5960 A-H-500-001
SL. NO	ITEM	UNITS	BIDDER TO INDICATE
.4.1	Manufacturer's name		
.4.2	Applicable standards		
4.3	Voltage class	kV	
4.4	Impulse withstand voltage	kVP	
4.5	One minute power frequency withstand voltage	kV	
4.6	Dynamic current rating	kAP	
4.7	Short circuit time and duration	kA	
4.8	Continuous current rating at 50°C design ambient air temperature	Amp	
4.9	Maximum temperature rise over 50°C ambient air temperature		
	(a) Enclosure	°C	
	(b) Bus conductor	°C	
4.10	Busbar material & grade		
4.11	Bus enclosure material		
4.12	Phase barrier material		
4.13	Degree of protection of enclosure for the bus duct		
4.14	Clearances between live point and earth	mm	
4.15	Insulator / Seal off bushings		
	(a) Material		
	(b) Voltage class	kV	
	(c) Creepage distance	mm	
NOTE TO BIDDER			
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		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6
		TITLE	SHEET 81 of 100
		1 X700) MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – ELECTRICAL SYSTEMS	SPEC. NO. TCE.5960 A-H-500-001
SL. NO	<u>ITEM</u>	UNITS	BIDDER TO INDICATE
6.0	<u>400 V Switchboards / MCCs</u>		
7.0	<u>Swtichboard & Bus Bars</u>		
7.1	Manufacturer's name		
7.2	Applicable standards		
NOTE TO BIDDER		SIGNATURE	
1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK(*) (DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS)		OF BIDDER	
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		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6
		TITLE	SHEET 82 of 100
		1 X700) MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – ELECTRICAL SYSTEMS	SPEC. NO. TCE.5960 A-H-500-001
SL. NO	ITEM	UNITS	BIDDER TO INDICATE
7.3	Single front or Double front		
7.4	Modular construction	Yes/ No	
7.5	Type of execution (Drawout / fixed)		
7.5.1	For ACB modules	Yes / No	
7.5.2	For rest of the modules	Yes / No	
7.6	Bus bar continuous current ratings under site conditions for each switch board / MCC	Amp	
7.7	Sheet steel		
7.7.1	Material (cold rolled / hot rolled)		
7.7.2	Thickness for		
	(a) Frame		
	(b) Door		
	(c) Rear covers		
	(d) Side & top cover		
7.8	Short time thermal rating and duration	kA secs.	
7.9	Momentary rating	kAP	
7.10	One minute P.F voltage withstand		
7.10.1	Main circuits	kV	
7.10.2	Control circuits	kV	
7.10.3	Aux. Circuits	kV	
7.11	Degree of protection for enclosure		
7.12	Material of bus bar		
7.13	Type of insulation for bus bar		
7.14	Temperature rise over reference ambient for		
	(a) Joints	deg.C	
	(b) Along the run	deg.C	
7.15	Clearance in air		
NOTE TO BIDDER			SIGNATURE
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		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6
		TITLE	SHEET 83 of 100
		1 X700) MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – ELECTRICAL SYSTEMS	SPEC. NO. TCE.5960 A-H-500-001
SL. NO	ITEM	UNITS	BIDDER TO INDICATE
7.15.1	Phase to phase	mm	
7.15.2	Phase to ground	mm	
8.0	<u>Circuit Breakers</u>		
8.1	Make & type nos.		
8.2	Applicable standard		
8.3	Rated voltage		
8.4	Rated operating duty		
8.5	Rated current & derated currents at site condition		
8.6	Operating mechanism type		
8.7	Spring charging time		
8.8	Have electrical & mechanical anti pumping features been provided		
8.9	Rated symmetrical breaking current	kA rms	
8.10	Rated making current	kAp	
8.11	Short time current and duration	kA secs.	
9.0	<u>Contactors</u>		
9.1	Make		
9.2	Rated voltage of coil		
9.3	Rated duty		
9.4	Rated utilisation category		
10.0	<u>Current Transformers</u>		
10.1	Accuracy class		
10.2	Instrument security factor / accuracy limit factor		
10.3	Short time withstand current and time		
10.3.1	For switch fuse controlled modules		
NOTE TO BIDDER			SIGNATURE
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		TITLE	SHEET 84 of 100
		1 X700) MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – ELECTRICAL SYSTEMS	SPEC. NO. TCE.5960 A-H-500-001
SL. NO	ITEM	UNITS	BIDDER TO INDICATE
10.3.2	For breaker controlled modules		
11.0	<u>Voltage Transformer</u>		
11.1	Output		
11.2	Accuracy class		
11.3	Over voltage factor		
13.13.0	<u>Protective Relays</u>		
13.13.1	Whether inverse time over current & inverse time / EF relays provided for incomers and bus coupler.		
13.13.2	Relay types for protection & for under voltage		
13.13.3	Accuracy class of meters		
13.0	<u>Wiring</u>		
13.1	Minimum size of		
13.1.2	Power wiring		
13.1.3	Control wiring		
13.2	Conductor material		
13.3	Whether CT / PT terminals have shorting facilities & disconnection facilities		
14.0	<u>400C AC Distribution Board / Control Panel</u>		
14.1	Designation		
14.2	Degree of protection for enclosure		
14.3	Short circuit thermal rating and duration	kA secs.	
14.4	Minimum wire size for		
14.4.1	Power	Sq.mm	
14.4.2	Control	Sq.mm	
14.4.3	Conductor material for wires		
NOTE TO BIDDER			
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		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6
		TITLE	SHEET 85 of 100
		1 X700) MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – ELECTRICAL SYSTEMS	SPEC. NO. TCE.5960 A-H-500-001
SL. NO	ITEM	UNITS	BIDDER TO INDICATE
15.0	<u>DC System</u>		
15.1	Battery		
15.1.1	Manufacturer's name /Type		
15.1.2	Standard to which battery is manufactured		
15.1.3	Capacity at 27°C		
	(a Capacity at high discharge rated at 27°C)		
	(b 1 minute)	AH	
	(c) 1 hour)	AH	
	(d 2 hour)		
	(e Expected life of battery)	Years	
15.1.4	Float charging voltage / current		
	(a Trickle charging voltage / current)		
	(b Boost charging voltage / current)		
15.1.5	Expected fault level at bus due to battery	kVA	
15.1.6	Type of positive plate		
15.1.7	No. of cells required to give rated DC voltage		
15.1.8	Type of containers		
15.2	<u>220 V Chargers</u>		
15.3.1	Manufacturer's name		
3.1			
15.3.1	Ratings	V AC	
3.2		Phase	
15.3.1	Output voltage	V DC	
3.3			
	(a) Nominal		
	(b) Settings range		
15.3.1	Rated output	kW	
3.4			
15.3.1	Voltage regulation with AVR, when supply voltage fluctuation is $\pm 10\%$ and frequency fluctuations between $\pm 5\%$		
3.5			
15.3.1	Current regulation with AVR, when supply voltage fluctuation is $\pm 10\%$ and frequency variations between $\pm 5\%$		
3.6			
NOTE TO BIDDER			SIGNATURE
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		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6
		TITLE	SHEET 86 of 100
		1 X700) MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – ELECTRICAL SYSTEMS	SPEC. NO. TCE.5960 A-H-500-001
SL. NO	ITEM	UNITS	BIDDER TO INDICATE
15.3.1 3.7	Type of voltage / current control and adjustment provided for charger during boost mod		
15.3.1 3.8	Guaranteed efficiency at rated load		
15.3.1 3.9	Power factor at rated load		
15.3.1 3.10	Class of insulation		
15.3.1 3.11	Rectifier transformer		
15.3.1 3.12	Smoothing reactor		
15.3.1 3.13	Type of rectifier cell		
15.3.1 3.14	Method of cooling		
15.3.1 3.15	Degree of protection for enclosure		
15.3.0	<u>220 V DC BOARD</u>		
15.3.1	Manufacturer's name		
15.3.2	Whether modular type		
15.3.3	Short time current rating and duration		
15.3.4	Degree of protection for enclosure		
NOTE TO BIDDER			SIGNATURE
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		TITLE	SHEET 87 of 100
		1 X700) MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – ELECTRICAL SYSTEMS	SPEC. NO. TCE.5960 A-H-500-001
SL. NO	ITEM	UNITS	BIDDER TO INDICATE
17.0	<u>Lighting System</u>		
17.1.1	Manufacturer's name		
17.1.2	Nominal working voltage	Volts	
	(a Maximum permissible supply voltage) variation for satisfactory operation of		
	(i) Fitting	±%	
	(ii) Accessories	±%	
17.2	<u>Lighting Distribution Board and Lighting panels</u>		
17.3.1 3.1	Degree of protection provided for following applications (as per IS 2147 or equivalent)		
	(a Indoor)		
	(b Outdoor)		
17.3	Applicable standards		
18.0	<u>Cabling System</u>		
18.1	<u>Cables</u>		
18.1.1	Manufacturers name		
18.1.2	Whether cores identified by Numerals for cables with 5 core and above	Yes / No	
18.1.3	Whether incremental running lengths are marked on cable	Yes / No	
18.1.4	Whether the cables comply with specification requirement	Yes / No	
NOTE TO BIDDER			SIGNATURE
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		TITLE	SHEET 88 of 100
		1 X700) MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – ELECTRICAL SYSTEMS	SPEC. NO. TCE.5960 A-H-500-001
SL. NO	ITEM	UNITS	BIDDER TO INDICATE
18.2	Fire Stops (General Particulars)		
18.3.1	Type FPSS system provided		
3.1			
18.3.1	Manufacturer's Name		
3.2			
18.3.1	Applicable standards		
3.3			
18.3.1	Fire Rating of FPSS	Mins	
3.4			
	a) Fire stops		
	b) Fire breaks		
18.3	<u>Fire Breaks</u>		
18.3.1	Manufacturer's Name		
18.3.2	Applicable standards		
18.3.3	Fire Rating of the fire break	Mins.	
19.0	<u>Earthing and Lighting Protection System</u>		
19.1	Material of earthing conductors		
19.2	Material and size of earth Electrodes		
19.3	Material and size of test pit Electrodes		
19.4	Material and size of lighting protection horizontal air termination and down conductors		
19.5	Material and size for vertical air termination rods for chimney		
19.6	Material and size for lighting protection conductors and down comers for chimney		
19.7	Confirmation that the soil restivity will be checked at site and the conductor selection will be done and provided in the plant accordingly.		
20.0	<u>Fire Detection and Alarm System</u>		
20.1	Manufacturer's Name		
20.2	Fire alarm panel		
20.3	Multi sensor		
20.4	Optical smoke detector		
20.5	Linear Heat Sensor cables		
NOTE TO BIDDER			SIGNATURE
1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK(*) (DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS)			OF BIDDER
2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.			DATE

		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION : F6	
		TITLE	SHEET 89 of 100	
		1 X700) MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – ELECTRICAL SYSTEMS	SPEC. NO. TCE.5960 A-H-500-001	
SL. NO	ITEM	UNITS	BIDDER TO INDICATE	
20.6	Rate of rise of temperature detector with fixed temperature element			
20.7	Manual call points			
20.8	Cables			
20.9	Battery (Ni Cd)			
20.10	Standards to which the system / equipment confirms to			
21.0	<u>Intrasite Communication System</u>			
21.1	Manufacturer's name			
21.3	Model/type of PA system			
23.13.0	<u>LT Motors</u>			
23.13.1	Manufacturer's name			
23.13.2	Applicable Standards			
23.13.3	Type of Duty (IS 325 or equivalent)			
23.13.4	Duty designation (IS 325 or equivalent)			
23.13.5	Supply conditions			
23.13.5.1	Rated voltage	V		
23.13.5.2	No. of phases			
23.13.5.3	Frequency			
23.13.6	Starting current in % of full load current	%		
23.13.7	Class of insulation			
23.13.7.1	Ref. Ambient Temp.	deg.C	50	
23.13.7.2	Temp. rise by Res. Method	deg.C		
23.13.8	Type of enclosure	Indoor / Outdoor		
23.13.9	Degree of protection (IS 4691 or equivalent)			
23.13.10	Min. voltage required under starting conditions to accelerate driven equipment to rated speed	Volts		
NOTE TO BIDDER			SIGNATURE	
1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK(*) (DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS)			OF BIDDER	
2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.			DATE	

		ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.		SECTION : F6	
		TITLE		SHEET 90 of 100	
		1 X700) MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TECHNICAL PARTICULARS – ELECTRICAL SYSTEMS		SPEC. NO. TCE.5960 A-H-500-001	
SL. NO	<u>ITEM</u>	UNITS	BIDDER TO INDICATE		
23.13.11	Hazardous area classification				
23.13.12	Surface temperature classification for flame proof motors (IS 8239)				
NOTE TO BIDDER			SIGNATURE		
1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK(*) (DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS)			OF BIDDER		
2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.			DATE		

SCHEDULE OF ESSENTIAL SPARES

The Bidder shall indicate the quantum of essential spares for the 700 MW CCPP as required for three (3) years operation of the combined cycle power plant included by Bidder in the Scope of supply.

Item No.	Manufacturer & Part No.	Description	Qty per Unit/ Eqpt.	Qty Included in offer.	Unit Price CIF(Indian Port) Ex works	Sub Total (5x6)	Total Price * 2	Remarks
1	2	3	4	5	6	7	8	9

Notes:

- * 1: Sum of all items indicated against column 6 shall be equal to the price indicated against the corresponding item in Section – F15. The schedule with prices shall be included along with the price bid. Only the list of spares offered without the prices shall be furnished along with the technical bid.
- * 2: (a) For imported spares, the total price indicated against column 8 shall include CIF price (Indian port), customs duty, customs clearance and handling charges at Indian port, local transportation charges from Indian port to site, transit insurance, unloading at site and storage.
- (b) For indigenous spares, the total price shall include ex-works price, local transportation charges from ex-works to site, transit insurance, all taxes and duties, unloading at site and storage.

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TITLE

1X 700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.

SHEET 1 OF 1

SCHEDULE OF RECOMMENDED SPARE PARTS

SPEC. NO.
TCE.5960A-H-500-001

The BIDDER shall give a list of spare parts recommended for trouble-free performance for the 700 MW CCPP till the first major inspection in the format given below.

Item No.	Manufacturer & Part No.	Description	Qty. per unit/ eqpt.	Qty Recommended	Unit price CIF(Indian port) / Ex-Works	Sub Total (5x6)	Total Price *1	Remarks
1	2	3	4	5	6	7	8	9

NOTE:

- *1. (a) For imported spares, the total price indicated against column 8 shall include CIF(Indian port) price, customs duty, customs clearance and handling charges at Indian port, local transportation charges from Indian port to site, transit insurance, unloading at site and storage.
- (b) For indigenous spares, the total price shall include ex-works price, local transportation charges from ex-works to site, transit insurance all taxes and duties, unloading at site and storage.

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ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.

SECTION: F10

TITLE

1x 700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.

SHEET 1 OF 1

SCHEDULE OF SUB-VENDORS

SPEC. NO.
TCE.5960A-H-500-001

The Bidder shall indicate the details of Sub-Vendors and Sub-contractors proposed for the 700 MW CCPP:

Sl. No.	Item of Equipment / Service	Name of Company	E-mail, Fax, Telephone & Postal Addresses Location of Works	Remarks

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NAME

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	ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION: F11
	TITLE 1X 700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.	SHEET 1 OF 1
	SCHEDULE OF QUALITY ASSURANCE PLAN	SPEC. NO. TCE.5960A-H-500-001

Bidder shall furnish as below the Quality Assurance Program for all the items manufactured / supplied, construction and erection at site and commissioning in the format :

The program shall include the details of main contractor and all sub-vendors.

QUALITY ASSURANCE PLAN		MAIN CONTRACTOR			MAIN ITEM			Q.P. NO.			
		SUB - VENDOR			SUB - ITEM			Q.P.DATE			
CLIENT	PROJECT			P.O.NO. & DT.			TCE REF.				
SR. NO.	COMPONENT / OPERATION	CHARACTERISTICS CHECKED	TYPE / METHOD OF CHECK	EXTENT	REF. DOCUMENT / ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY			REMARKS / OWNER HOLD POINTS (H)	
							S	M	O		
1	2	3	4	5	6	7	8			H	9
NOTICE	A. STATUTORY REQUIREMENTS SHALL BE COMPLIED WITH BY THE VENDOR.							S	SIGN.		
	B. MATERIAL TESTS OF SAMPLES DRAWN BY OWNER / OWNER'S REPRESENTATIVE SHALL BE WITNESSED BY OWNER / OWNER'S REPRESENTATIVE.								NAME		
	C. FOR STAGES WITNESSED / DOCUMENTS REVIEWED BY OWNER / OWNER'S REPRESENTATIVE, COPIES OF RELEVANT DOCUMENTS SHALL BE FURNISHED TO OWNER / OWNER'S REPRESENTATIVE.							M	SIGN.		
	D. OWNER / OWNER'S REPRESENTATIVES IDENTIFICATION STAMP ON MATERIALS SHALL BE PRESERVED / GOT TRANSFERRED BY OWNER / OWNER'S REPRESENTATIVE AT APPROPRIATE STAGES.								NAME		
	E. THE EXTENT INDICATED IN COLUMN 5 IS IN VENDOR'S SCOPE. OWNER / OWNER'S REPRESENTATIVES MAY INSPECT AS PER THIS COLUMN OR RANDOM SAMPLES.							T	SIGN.		
	F. COLUMN 6 SHALL BE AS PER OWNER / CONTRACTOR APPROVED DRAWINGS / DATA SHEETS / SPECIFICATIONS AS APPLICABLE AS PER DOCUMENT SUBMISSION SCHEDULE OF SECTION C-10.								NAME		
	G. ALL INSTRUMENTATION FOR QUALITY ASSURANCE PLAN SHALL HAVE VALID CALIBRATION CERTIFICATE WITH TRACEABILITY TO NATIONAL LEVEL.							C	SIGN.		
	H. LEGENDS : S - SUB - VENDOR, M - MAIN VENDOR, O- OWNER / OWNER'S REPRESENTATIVE, 1 - WITNESS, 2 - DOCUMENTS REVIEW, H - HOLD POINT.								NAME		

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**SCHEDULE OF MAJOR SOFTWARE PACKAGES
TO BE USED**

The Bidder shall furnish the details of major software packages as included below :

1.0 SOFTWARE FOR PROJECT SCHEDULING

1.1 Name of Software to be used

1.2 Whether Bidder has license for the same? : Yes/No

1.3 Copy of license enclosed : Yes/No

1.4 Projects for which Bidder has used the same. Bidder :
to furnish details

1.5 Catalogue of software enclosed : Yes/No

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	ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION: F12
	<small>TITLE</small> 1X 700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF MAJOR SOFTWARE PACKAGES TO BE USED	SHEET 2 OF 3 SPEC. NO. TCE.5960A-H-500-001

4.0 **SOFTWARE FOR CIVIL ANALYSIS**

4.1 Name of Software to be used

4.2 Whether Bidder has license for the same? : Yes/No

4.3 Copy of license enclosed : Yes/No

4.4 Projects for which Bidder has used the same. Bidder :
to furnish details

4.5 Catalogue of software enclosed : Yes/No

5.0 **SOFTWARE FOR DOCUMENTATION SCHEDULE / DOCUMENT MANAGEMENT**

5.1 Name of Software to be used

5.2 Whether Bidder has license for the same? : Yes/No

5.3 Copy of license enclosed : Yes/No

5.4 Projects for which Bidder has used the same. Bidder :
to furnish details

5.5 Catalogue of software enclosed : Yes/No

6.0 **SOFTWARE FOR DRAWINGS INCLUDING CONSTRUCTION DRAWINGS
NOT INCLUDED IN 2.0 ABOVE**

6.1 Name of Software to be used

6.2 Whether Bidder has license for the same? : Yes/No

6.3 Copy of license enclosed : Yes/No

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	ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION: F12
	<small>TITLE</small> 1X 700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF MAJOR SOFTWARE PACKAGES TO BE USED	SHEET 3 OF 3 SPEC. NO. TCE.5960A-H-500-001

- 6.4 Projects for which Bidder has used the same. Bidder :
to furnish details
- 6.5 Catalogue of software enclosed : Yes/No
- 7.0 **SOFTWARE FOR ANY OTHER ITEMS**
- 7.1 Name of Software to be used
- 7.2 Whether Bidder has license for the same? : Yes/No
- 7.3 Copy of license enclosed : Yes/No
- 7.4 Projects for which Bidder has used the same. Bidder :
to furnish details
- 7.5 Catalogue of software enclosed : Yes/No

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TITLE

1X 700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.

SCHEDULE OF TRAINING OF OWNER'S PERSONNEL

The Bidder shall furnish the details of Training of Owner's Personnel as below :

1.0 **TRAINING BY EPC CONTRACTOR**

1.1 **Training for Operators**

		TARGET GROUP					
		Mech.		Elect.		I & C	
		At works, other plants	At Site, Class & training	At works, other plants	At Site, Class & training	At works, other plants	At Site, Class & training
1.1.8	Cooling water system						
1.1.9	Balance of plant						
1.1.11	Plant upsets and safety						

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TITLE

1X 700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.

SCHEDULE OF TRAINING OF OWNER'S PERSONNEL

1.2 **Training for Maintenance Personnel**

		TARGET GROUP							
		GTG / HRSG		HRSG / Steam & Water cycle		Electrical		BOP	
		At works other plants	At Site, Class & training	At works other plants	At Site, Class & training	At works other plants	At Site, Class & training	At works other plants	At Site, Class & training
1.2.8	Cooling water system								
1.2.9	Balance of plant								
1.2.10	Routine inspection and maintenance of all of the above								
1.2.11	Preventive maintenance programme, trouble shooting and fault tracing								
1.2.12	Alignment procedures								
1.2.13	Any other.								

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	ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD.	SECTION: F13
	TITLE	SHEET 3 OF 3
	1X 700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF TRAINING OF OWNER'S PERSONNEL	SPEC. NO. TCE.5960A-H-500-001

2.0 **HANDS-ON TRAINING**

Owner's staff for specific areas / functions from participants of above courses will be given hands-on training by erection, testing and commissioning staff of Contractor / Sub-contractor in such a manner that erection, testing and commissioning of plant, safety and warranties are not affected. **Included / Not Included**

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SECTION: F14

TITLE

SHEET 1 OF 1

**1X 700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.
SCHEDULE OF CONSTRUCTION POWER AND WATER
REQUIREMENT**

SPEC.NO

TCE-5960A-H-500-001

CONSTRUCTION POWER REQUIREMENT

The BIDDER shall indicate the total construction power required for the 700 MW CCPP as shown below for different stages of project execution.

Sl. No.	Stages of Erection	Period of Construction, Months	kVA max.	kVA Average	kW
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CONSTRUCTION WATER REQUIREMENT

The BIDDER shall indicate the total construction water required for the 700 MW CCPP as shown below for different stages of project execution.

Sl. No.	Stages of Erection	Period of Construction, Months	Cu.m
---------	--------------------	--------------------------------	------

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The EPC contract shall be divided into three (3) contracts as indicated below.
The bidder shall indicate the quoted price against each contract separately.

Sl. No.	Details	Combined Cycle Power Plant as per Specification	
		Foreign currency component (Specify currency name)	Indian Rupee component
(1)	(2)	(3)	(4)
1.0	<u>CONTRACT NO. 1</u>		
	<u>OFF SHORE SUPPLY CONTRACT</u>		
1.1	<u>SUPPLY PRICE</u>		
1.1.1	Scope of supply as per enquiry document inclusive of:		
	(e) Balance of plant (BOP)		
1.1.2	Sub total of scope of supply at CIF including packing and forwarding for items 1.1.1 (a) to (e)		
1.1.3	Sub-Total for contract No. 1 (Item No. 1.1.2)		

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1 X700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.
SCHEDULE OF PRICES AND DELIVERY

SHEET 2 OF 8

SPEC. NO.
TCE.5960A-H-500-001

Sl. No.	Details	Combined Cycle Power Plant as per Specification	
		Foreign currency component (Specify currency name)	Indian Rupee component
(1)	(2)	(3)	(4)
2.0	<u>CONTRACT NO. 2</u> <u>ON SHORE SUPPLY CONTRACT</u>		
2.1	Scope of supply as per enquiry document (Bidder to indicate the supply items included under this contract)		
2.1.1	Ex-works price including packing and forwarding		
2.1.2	Transport		
2.1.3	Insurance		
2.1.4	Excise duty		
2.1.5	C.S.T.		
2.1.6	Other taxes and duties, if any		
2.1.7	Sub-Total for Contract No. 2 (Item No.3.1.1 to 3.1.6)		

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ANDHRA PRADESH POWER DEVELOPMENTCOMPANY LTD

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1 X700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.
SCHEDULE OF PRICES AND DELIVERY

SHEET 3 OF 8

SPEC. NO.
TCE.5960A-H-500-001

SI. No.	Details	Combined Cycle Power Plant as per Specification	
		Foreign currency component (Specify currency name)	Indian Rupee component
(1)	(2)	(3)	(4)
3.0	<u>CONTRACT NO. 3</u> <u>ON SHORE SERVICES CONTRACT</u>		
3.1	Design And Detailed Engineering		
3.2	Training of O & M personnel		
3.3	Handling of imported goods and transportation to site		
3.3.1	Customs duty		
3.3.2	Clearing and forwarding charges		
3.3.3	Transport		
3.3.4	Insurance		
3.3.4	Other taxes & duties, if any		
3.3.5	Sub Total of items 3.3.1 to 3.3.4		
3.4	Handling of indogeneous goods and transportation to site		
3.4.1	Duties and Taxes if any		
3.4.2	Transportation		
3.4.3	Insurance		
3.4.4	Sub Total of items 4.4.1 to 4.4.3		
3.5	Civil Works Contract		
3.6	Construction, Erection and		

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	ANDHRA PRADESH POWER DEVELOPMENTCOMPANY LTD	SECTION: F15
	1 X700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST. SCHEDULE OF PRICES AND DELIVERY	SHEET 4 OF 8
		SPEC. NO. TCE.5960A-H-500-001

	Commissioning		
3.7	Project Management		
3.8	Performance guarantee tests		
3.9	<u>Sub-total for contract no. 3 (item no.3.1 to 3.8)</u>		

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Sl. No.	Details	Combined Cycle Power Plant as per Specification For components from VENDOR's works	For components supplied from SUB-VENDOR's works directly to site.
(1)	(2)	(3)	(4)
4.0	Total price for essential spares as per schedule F-7 of Volume-II		
5.0	Total price for recommended spares as per schedule F-8 of Volume-II		
6.0	Total price for maintenance of tools and tackles as per schedule F-9 of Volume-II		
7.0	Validity of Bid from the date of Price Bid opening.		
8.0	Guaranteed completion period under liquidated damages		

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10.0 SCHEDULE OF PAYMENTS BASED ON ANTICIPATED WORK SCHEDULE

Months from Notice to Proceed	Milestones *				Total Amount inclusive of Retainage		Cumulative Amount inclusive of Retainage		Cumulative Percentage of Contract Price inclusive of Retainage		Retainage Percentage of Contract Price		
	Approval documents to Owner / Owner's Representative	Civil	Mechanical	Electrical	Instrumentation & control	Foreign currency (Specify currency name)	Indian Rupee	Foreign currency (Specify currency name)	Indian Rupee	Foreign currency portion	Indian Rupee portion	Foreign currency portion	Indian Rupee portion
Advance													
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
..													
..													
..													
..													
32													
..													
36													

* NOTES:

- a) The milestones indicated here in the above table shall be the same as in the milestones to be indicated on Project Network Schedule. This would be reviewed further with successful Bidder
- b) The amount indicated against each month shall be paid at the end of the month based on actual completion of Milestone during the execution stage in case of award of Contract.

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ANDHRA PRADESH POWER DEVELOPMENTCOMPANY LTD

SECTION: F15

1 X700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.
SCHEDULE OF PRICES AND DELIVERY

SHEET 7 OF 8

SPEC. NO.
TCE.5960A-H-500-001

11.0	<u>PRICE BREAK – UP OF PRICES OF BALANCE OF PLANT (BOP)</u>	Foreign currency component (Specify currency name)	Indian Rupee component
11.1	Site development		
11.2	Civil works		
11.4	Piping system including valves, specialities and insulation as covered under this specification		
11.5	Induced draft cooling tower		
11.8	Clarifiers, Filtration plant, DM plant and DM water storage tanks		
11.9	Fire protection system		
11.11	Cranes and Hoists		
11.14	Transformers		
11.15	Switchgears (LT)		
11.16	DC and UPS system		

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ANDHRA PRADESH POWER DEVELOPMENTCOMPANY LTD

SECTION: F15

1 X700 MW CCPP AT NEDUNOOR, KARIMNAGAR DIST.
SCHEDULE OF PRICES AND DELIVERY

SHEET 8 OF 8

SPEC. NO.
TCE.5960A-H-500-001

		Foreign currency component (Specify currency name)	Indian Rupee component
11.17	Construction power supply system		
11.18	Construction water supply system		
11.19	Balance of plant not covered above		
	a) Mechanical		
	b) Electrical		
	c) Control & Instrumentation		
	d) Any other missing items (Bidder to indicate)		

Notes :

1. BIDDERS to note that if they have included any foreign exchange components of price in Indian rupee component, exchange rate variation for such foreign currency components so included would not be available.

SIGNATURE _____

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