Request for Proposal (RFP) for Boiler and ESP Package for Overhaul of GMDC's 250 (2x125) MW Akrimota Thermal Power Station (ATPS), Gujarat

RFP No: GMDC/Power/ATPS/05/23-24

General Manager (Power & Purchase)

Gujarat Mineral Development Corporation Ltd.

(A Govt. Of Gujarat Enterprise)

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Table of Contents

Glossary

Abbreviation	Full form
ACP	Auxiliary Control Pump
APC	Auxiliary Power Consumption
ASME	American Society for Mechanical Engineers
ATPS	Akrimota Thermal Power Station
BFP	Boiler Feed Pump
BMCR	Boiler Maximum Continuous Rating
BOQ	Bill of Quantities
C&I	Control and Instrumentation
CCW	Closed Cooling Water
CFBC	Circulating Fluidized Bed Combustion
COC	Cycles of concentration
COD	Common Outlet Duct
DFT	Dry Film Thickness
DP	Differential Pressure
DPT	Dye Penetrant Test
EMD	Earnest Money Deposit
EOT	Electric Overhead Travelling
EPDM	Ethylene Propylene Diene Terpolymer
ERV	Electronic Relief Valve
ESP	Electrostatic Precipitator
ETU	Ethernet Terminal Unit
FAT	Factory Acceptance Test
FiS	Financial Score
FOPH	Fuel Oil Pump House
FRS	Feed Regulating Station
GD	Gas Distribution
GI	Galvanized Iron
GMDC	Gujarat Mineral Development Cooperation
HFO	Heavy Fuel Oil
HFTR	High Voltage Rectifier Transformer
HHV	High heating value
HRSB	Half Retractable Soot Blower
HSE	Health, Safety, Environment
IBD	Intermittent Blow Down
IBR	Indian Boiler Regulations
ID	Induced Draught
IE2/EFF2	International Efficiency Class 2
IGV	Inlet Guide Vane
KPI	Key Performance Indicators
L.O	Lube Oil

Abbreviation	Full form
LDO	Light Diesel Oil
LHV	Lower Heating Value
LOA	Letter of Acceptance
LPG	Liquified Petroleum Gas
LRSB	Long Retractable Soot Blower
MCC	Motor Control Centre
MCR	Maximum Continuous Rating
MD	Maximum Demand
MFT	Master Fuel Trip
MOC	Material of construction
MOV	Motor Operated valve
MRV	Multi Role Valve
MS	Mild Steel
MSME	Micro, Small, Medium enterprises
MSRT	Multiple Revit Tool
MSSV	Main Steam Safety Valve
NABL	National Accreditation Board for Testing and Calibration Laboratories
O&M	Operations and maintenance
OEM	Original Equipment manufacturer
P&ID	Piping and Instrumentation Design
PA	Primary Air
PG	Performance Guarantee
PHE	Plate Heat Exchanger
PMC	Project Management Consultancy
PPA	Power Purchase Agreement
PRDS	Pressure Reducing and De-superheating Station
PSU	Public Sector Undertaking
QAP	Quality assurance plan
QCP	Quality control plan
QIP	Quality Inspection Plan
RALF	Rotary Air Lock Feeder
RC	Remote Control
RFP	Request for proposals
RH	Reheater
RPM	Revolutions per minute
RTD	Resistance Temperature Detectors
SA	Secondary Air
SAT	Site Acceptance Test
SCAPH	Steam Coil Air Preheater
SH	Superheater
SHR	Station heat rate
SIR	Switched Integrated Rectifier

Abbreviation	Full form
SOV	Solenoid Operated Valve
SS	Stain Steel
SWAS	Steam and Water Analysis System
TAPH	Tubular Air Preheater
TDS	Tax Deducted at source
TEFC	Totally Enclosed Fan Cooled
TeS	Technical Score
TPH	Tons / hour
TR	Ton of refrigeration
VFD	Variable Frequency Drive

Disclaimer

This RFP is being issued by the Gujarat Mineral Development Corporation Ltd (GMDC) (hereunder called “Authority”/ “GMDC”) to the Bidders interested in providing services for the Overhaul of Boiler and ESP at 250 (2*125) MW lignite based Akrimota Thermal Power Project in Kutch District, Gujarat.

It is hereby clarified that this RFP is not an agreement, and the purpose of this RFP is to provide the Bidder(s) with information to assist in the formulation of their proposals/Bids. While the RFP has been prepared in good faith with due care and caution, GMDC does not accept any liability or responsibility for the accuracy, reasonableness, or completeness of the information, or for any errors, omissions, or misstatements, negligent or otherwise, relating to any feasibility / detailed project report or any other reference document mentioned, implied, or referred herein. This RFP may not be appropriate for all persons. It is not possible for GMDC to consider the investment objectives, financial situation and particular needs of each Proposer/Bidder who reads or uses this RFP. Each Proposer/Bidder should conduct its own investigations and analysis and should check the accuracy, reliability, and completeness of the information in this RFP and where necessary obtain independent advice from appropriate sources.

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The Bidder shall bear all costs associated with or relating to the preparation and submission of its Bid including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by GMDC, or any other costs incurred in connection with or relating to its Bid, regardless of the conduct or outcome of the Bidding process.

Part 1: Introduction

1. Background about GMDC

Gujarat Mineral Development Corporation Ltd (GMDC) is a leading state-owned mining and minerals company in the western Indian state of Gujarat with operational experience spanning nearly 50 years. GMDC is a zero-debt company listed on national and Bombay Stock Exchanges. The Government of Gujarat (GoG) disinvested 26% stake to the public shareholders vide an IPO in 1997 while the balance ownership is held by the Government of Gujarat.

GMDC's product portfolio spans across mining, value added products, and power, with mining activities spread across the state of Gujarat in districts Kutch, Devbhoomi Dwarka, Panchmahal, Vadodara, Bhavnagar, Bharuch, Surat and Chotaudepur. It currently mines Lignite from five operational mines, with five upcoming mines in the pipeline, and other minerals including Bauxite, Fluorspar, Manganese, Ball Clay, Silica Sand, Bentonitic Clay, and Limestone. It provides value added services through works such as Pyrite removal from Lignite, Beneficiation of Bauxite, low-grade Manganese, and Fluorspar.

To leverage its experience in mining operations, GMDC has set up a diversified power portfolio with forward integration into a 2X125 MW lignite-based thermal power Plant in Nani Chher, Gujarat, and clean energy sources including 200.9 MW of Wind power assets in Maliya, Jodiya, Gorsar, Bhanvad, Bada, Varvala, Rojmal, and a 5 MW Solar power project in Panandhro.

2. Plant details

2.1 Background about ATPS

GMDC has been operating a 250 MW lignite-based thermal power Plant (Akrimota Thermal Power Station, ATPS) over the past 15 years. ATPS has two units of 125 MW each commissioned in July 2006, and March 2007 respectively.

ATPS procures lignite required for generation of power from GMDC's mines (Mata na Madh, and Umarsar) located at proximity (~60 km) and transported directly to the Plant via road. Furthermore, the water supply to the power Plant is ensured through nearest Kori creek (through 1.4 km long sea water intake channel).

ATPS has a long-term power purchase agreement with GUVNL for supply of power till 2036, for the recovery of fixed charges and variable charges as per the actual Plant performance parameters (net availability, station heat rate, auxiliary power consumption).

2.2 Technical specifications

ATPS has circulating fluidized bed combustion (CFBC) boilers in both units, supplied by Alstom (later acquired by GE) at the time of commissioning.

The key technical specifications and process parameters for the boiler and associated auxiliaries, and the current specifications of the electrostatic precipitator (ESP) as per the

OEM design and commissioning documents have been detailed below. The detailed technical specifications are enclosed in Annexure 1.

2.2.1 Design specifications

Design specifications of the boiler and associated auxiliaries have been detailed below:

Equipment	**Boiler**
Make	Alstom Energy Systems GmbH (later acquired by GE)
Type of Boiler	CFBC boiler - 405 TPH
Reg. No.	GT-4878 and GT- 5040
Pressure	159 barg
Temperature	538°C
Heating surface area	23044 m2
Pressure component	SH1, SH2, SH3, SH4, SH5, RH1, RH2, Economizer, Water wall tubes and header
Furnace size in meters	12.9 x 8.0mtr
1st Pass	Water wall, SH4(23.5 mtr from 0 mtr), RH2(28.5 mtr from 0 Mtr)
2nd Pass	SH1, SH2, SH3, SH5, RH1, Economiser
Drum Details	MOC- BS-EN-10028-2-1993 Gr. NC 271, Dia-1372 mm, Thickness-68 mm
Equipment Name:	**Furnace**
Type:	CFBC
Material to be handled:	Lignite
Make:	Alstom Energy Systems GmbH (later acquired by GE)
Combustion chamber volume:	3674 cubic meter
Design Standard:	IBR/ISO ASME material
Equipment Name:	**Boiler Drum**
Specification of material:	SA-299
Elevation of drum:	51 M
Overall length:	13000 mm
Thickness of the shell:	110 mm
Equipment Name:	**Superheater**
Make:	Alstom Energy Systems GmbH (later acquired by GE)
Number of stages:	5
Specification of material:	SA-210/SA-209/SA-213

Type of flow:	SH4, RH2- Parallel SH3, SH5, RH1 - Counter
Number and type of thermocouples fitted to superheater tubes	60 Nos type-K thermocouples on SH tubes near headers
Equipment Name:	**Reheater**
Make:	Alstom Energy Systems GmbH (later acquired by GE)
Number of stages:	2
Specification of material Type of flow (counter or parallel)	RH1 Counter SA-209 RH2 Parallel SA-213
Equipment Name:	**TAPH**
Type:	Tubular
Manufacturer:	ABB-ABL
Number of air heaters per boiler	1 (primary + secondary)
Number of tubes:	4992
Number of blocks	3 primary + 3 secondary per TAPH
Equipment Name:	**PA fan**
Type:	Backward Curve Aero foil
Manufacturer:	Andrew Yule & Co.
Size and model:	2350 MM DIBAB-11
Shaft power:	1040 KW
Rated speed:	1490 RPM
Shaft diameter at bearing:	125 MM
Shaft diameter at impeller:	315 MM
Material:	EN 8
Bearing type:	Journal size – 5''
Equipment Name:	**SA fan**
Type:	Backward Curve Aero foil
Manufacturer:	Andrew Yule & Co.
Size and model:	2030 MM DIBAB-11
Shaft power:	742 KW
Rated speed:	1490 RPM

Shaft diameter at bearing:	101.6 MM
Shaft diameter at impeller:	290 MM
Material:	EN 8
Bearing type:	Journal size – 4''
Equipment Name:	**ID fan**
Type:	Backward Curve Laminar
Manufacturer:	Andrew Yule & Co.
Size and model:	2990 MM DIBCB-42
Shaft power:	718 KW
Rated speed:	710 RPM
Shaft diameter at bearing:	190.5 MM
Shaft diameter at impeller:	405 MM
Material:	EN 8
Bearing type:	Journal size – 190.5
Equipment Name:	**FA fan**
Make:	RKR Verdichtechnik GmbH
Model:	K-145-R-LP
Capacity:	100 M3/Min
Power:	129.1 KW
RPM:	1360
Equipment Name:	**Ash Cooler Fan**
Type:	Backward Curve Laminar
Make:	Andrew Yule & Co.
Size and model:	1270 MM SIPSC-05
Shaft power:	120 KW
Rated speed:	2980 RPM
Bearing type:	Ball/Roller
Size of Bearing:	70/80 MM
Fan No:	01019
Equipment Name:	**Cyclone**
Quantity	4
Manufacturer:	Alstom Energy Systems GmbH

Casing	IS:2026				
Lining	Fire and insulating brick				
Plate thickness	10 mm				
Equipment Name:	**Gravimetric feeder**				
Make:	Stork Equipment Company				
Model No:	LPG30				
Capacity:	127 TPH (Max) and 12.7 TPH (Min)				
Belt drive motor:	14.9 KW (20 HP)				
Equipment Name:	**Lignite Draglink**				
Make:	Alstom				
Capacity:	11.5 to 115 T/hr.				
Speed:	0.035 m/min				
Dimensions:	HS 1000 II X 12.4 mm				
Equipment Name:	**Lime dosing system**				
Type:	Drag Link <---------Rotary----------> Screw				
Make	Elecon or Equal <-----Approved make ------> Elecon or Equal				
Location	Below lime bunkers	Below lime bunkers	Below bag filters	Below lime dust day bins	Below bag filters
Quantity	3	3	3	4	3
Capacity (TPH)	125	125	15	80	15
Equipment Name:	**Bed Ash Cooler**				
Make:	Alstom				
Inlet temperature:	850 deg				
Outlet temperature:	130 deg (max 230 deg)				
Equipment Name:	**Ash draglink**				
Make:	Alstom				
Type:	R-01				
Bed ash particle size:	0 to 6 mm				
Sr. No.	02/00188-0201,SMD FORDERTECHNIK GMBH				

Equipment Name:	**Ash rotary seal**
Make:	Neha Engineering
Type and dimensions:	Rotary air lock valve 400X400 mm gate type
Motor specifications:	1.5KW VFD duty geared motor with mounting flange and zero speech switches
Equipment Name:	**Ash cooler PHE**
Make:	Alfa Laval
Type:	AK20FG
Material:	Titanium as per SB265 GR.1
Plate thickness:	0.6 mm
Design Pressure:	13 Kg/cm^2
Design Temperature:	120 deg
Gasket Material:	ALEPDM(GLUED)
Sr. No.	30106-94-818,DRAWING NO.2822483
Equipment Name:	**Lignite Rotary Air Lock Feeder**
Make:	Alstom
Equipment Name:	**Cyclone Rotary Feeder**
Make:	Hyquip Rotolock Pvt. Ltd.
Type:	RAV 5600
Size:	560
Speed:	20 RPM
Gearbox Details:	Power Build Ltd, Type: 73P-D112M4, HP-5, N2 – 30 RPM, AMPS – 7.7A
Equipment Name:	**Day Bin Rotary Feeder**
Make:	Hyquip Rotolock Pvt. Ltd.
Type:	02.03
Size:	560
Speed:	25 RPM
Gearbox Details:	5 HP/KW, 25 RPM, Sr. No: 75702
Equipment Name:	**Weigh Feeder**
Make:	Transweigh Inia Ltd.
Type:	TLD 120/1.1 V

Capacity:	140 TPH
Belt Width:	1200 MM
Material:	Limestone

Design specifications of the existing ESP have been detailed below for 150 mg/Nm3 particulate matter:

Equipment Name:	**ESP**
Quantity	2
Manufacturer	Alstom
Number of electrical fields in series	6+1
Number of passes	2
Specific collecting plate voltage	148.74 sq.m/cu.m/sec for 7 fields 127.49 sq.m/cu.m/sec for 6 fields
Model Number	FAA 7*30H-96-150
Maximum bus voltage	70 kV
Average bus voltage	43 kV
Guaranteed power consumption	170 kW for continuously operated equipment
Guaranteed collection efficiency	99.889% with 90.9 g/NM^3 with all fields in operation 99.857% with 90.9 g/NM^3 with one field out of operation
Guaranteed pressure drop across ESP	20 mm wg
Guaranteed air leakage rate	1.01 m^3/sec
Inlet dust concentration	88 g/nm^3 for performance lignite in normal condition 205 g/nm^3 for worst lignite in normal condition 106 g/nm^3 for performance lignite in soot blowing condition
Outlet dust concentration with one field out of service	130 mg/nm^3 for performance lignite in normal condition 150 mg/nm^3 for worst lignite in normal condition 130 mg/nm^3 for performance lignite in soot blowing condition
Total active collection area	20,160 m^2 for 7 fields

2.2.2 Process parameters

Subsystem	Parameter	Units	Values	Remarks
Boiler Drum	Boiler drum working pressure	kg/cm^2(abs)	152	at 100% MCR of 405 TPH
	Design pressure	kg/cm^2	157	
	Design metal temperature	degrees C	346	
Burner	Total fuel flow for all heavy oil burners	kg/s	4078	at 45% boiler load
	Oil pressure at Burner	Bar	16	
	Combustion air temperature	degrees C	240	
Economizer	Feedwater temperature at economizer inlet	degrees C	246.8	at 100% MCR of 405 TPH
	Flue gases Temperature at Entrance to Economizer	degrees C	428	at 100% MCR of 405 TPH
	Flue gases Temperature at Exit of Economizer	degrees C	272	at 100% MCR of 405 TPH
	Feed water pressure at inlet to Economizer	kg/cm^2 (abs)	148.1	
	Feed water pressure at outlet of Economizer	kg/cm^2 (abs)	146.5	
	Total pressure drop in fuel gas path across economizer	mmWC	21	
Furnace	Furnace exit gas temperature	degrees C	865	at 100% BMCR of 405 TPH
	Total auxiliary power consumption in main steam generator	KW	5438	at 100% BMCR - Boiler Maximum Continuous Rating
	Design metal temperature	degrees C	393	
	Design pressure of tubes	kg/cm^2	155	
	Furnace design pressure	mmWC	1020	
	Design pressure of high-pressure piping	Bar	140	
	Design temperature of high-pressure piping	degrees C	540	
	Max. temperature thermal insulation material can withstand	degrees C	650	
	Bed Ash inlet temperature	degrees C	850	
	Bed Ash outlet temperature	degrees C	130	
	Nominal discharge capacity for performance lignite	T/hr.	11.3	
	Max. discharge capacity for performance lignite	T/hr.	16.2	
	Bed ash temperature	degrees C	260	
Soot Blower	Steam pressure	kg/sq cm	16	

Subsystem	Parameter	Units	Values	Remarks
	Steam temperature	degrees C	250	
Superheater	Steam flow at final superheater outlet	kg/hr.	405,000	at 100% BMCR of 405 TPH
	Steam pressure at final superheater outlet	kg/cm^2 (g)	140.1	at 100% BMCR of 405 TPH
	Steam temperature at final superheater outlet	degrees C	538	
	Flue gases Superheater stage 1 (SH5) entrance temperature	degrees C	807	at 100% BMCR of 405 TPH
	Flue gases Superheater stage 2 (SH3) entrance temperature	degrees C	708	at 100% BMCR of 405 TPH
	Flue gases Superheater stage 3 (RH1) entrance temperature	degrees C	565	at 100% BMCR of 405 TPH
	Steam temperature at Inlet to Superheater Stage 1 (SH1)	degrees C	339	at 100% BMCR of 405 TPH
	Steam temperature at Inlet to Superheater Stage 1 (SH2)	degrees C	342	at 100% BMCR of 405 TPH
	Steam temperature at Inlet to Superheater Stage 2 (SH3)	degrees C	357	at 100% BMCR of 405 TPH
	Steam temperature at Inlet to Superheater Stage 2 (SH4)	degrees C	400	at 100% BMCR of 405 TPH
	Steam temperature at Inlet to Superheater Stage 3 (SH5)	degrees C	469	at 100% BMCR of 405 TPH
	Steam temperature at Outlet to Superheater Stage 1 (SH1)	degrees C	342	at 100% BMCR of 405 TPH
	Steam temperature at Outlet to Superheater Stage 1 (SH2)	degrees C	357	at 100% BMCR of 405 TPH
	Steam temperature at Outlet to Superheater Stage 2 (SH3)	degrees C	425	at 100% BMCR of 405 TPH
	Steam temperature at Outlet to Superheater Stage 2 (SH4)	degrees C	494	at 100% BMCR of 405 TPH
	Steam temperature at Outlet to Superheater Stage 3 (SH5)	degrees C	540	at 100% BMCR of 405 TPH
	Steam pressure at Inlet to Superheater Stage 1 (SH1)	Kg/cm^2 (abs)	144.5	
	Steam pressure at Inlet to Superheater Stage 1 (SH2)	Kg/cm^2 (abs)	142.8	
	Steam pressure at Inlet to Superheater Stage 2 (SH3)	Kg/cm^2 (abs)	141.5	
	Steam pressure at Inlet to Superheater Stage 2 (SH4)	Kg/cm^2 (abs)	140	
	Steam pressure at Inlet to Superheater Stage 3 (SH5)	Kg/cm^2 (abs)	136.7	
	Steam pressure at Outlet to Superheater Stage 1 (SH1)	Kg/cm^2 (abs)	142.8	

Subsystem	Parameter	Units	Values	Remarks
	Steam pressure at Outlet to Superheater Stage 1 (SH2)	Kg/cm^2 (abs)	142.1	
	Steam pressure at Outlet to Superheater Stage 2 (SH3)	Kg/cm^2 (abs)	140.8	
	Steam pressure at Outlet to Superheater Stage 2 (SH4)	Kg/cm^2 (abs)	137.5	
	Steam pressure at Outlet to Superheater Stage 3 (SH5)	Kg/cm^2 (abs)	135	
	Total pressure drop in fuel gas path across superheaters	mmWC	13.6	
Reheater	Reheater steam flow	kg/hr.	377,680	at 100% BMCR of 405 TPH
	Steam temperature reheater outlet	degrees C	537	
	Steam temperature at reheater inlet	degrees C	355	at 100% BMCR of 405 TPH
	Pressure drop Across reheater	bar	1.84	at 100% BMCR of 405 TPH
	Steam temperature at Inlet to Reheater Stage 1 (RH1)	degrees C	340	at 100% BMCR of 405 TPH
	Steam temperature at Inlet to Reheater Stage 2 (RH2)	degrees C	442	at 100% BMCR of 405 TPH
	Steam temperature at Outlet to Reheater Stage 1 (RH1)	degrees C	464	at 100% BMCR of 405 TPH
	Steam temperature at Outlet to Reheater Stage 2 (RH2)	degrees C	540	at 100% BMCR of 405 TPH
	Steam pressure at Inlet to Reheater Stage 1 (RH1)	Kg/cm^2 (abs)	35.6	
	Steam pressure at Inlet to Reheater Stage 2 (RH2)	Kg/cm^2 (abs)	34.8	
	Steam pressure at Outlet to Reheater Stage 1 (RH1)	Kg/cm^2 (abs)	35.3	
	Steam pressure at Outlet to Reheater Stage 2 (RH2)	Kg/cm^2 (abs)	33.7	
	Total pressure drop in fuel gas path across reheaters	mmWC	12.9	
TAPH	Split of primary air and secondary air	%	45%(PA), 55%(SA)	
	Inlet temperature to the air heaters (PA)	degree C	46	
	Outlet temperature from air heaters (PA)	degree C	247	
	Inlet temperature to the air heaters (SA)	degree C	46	
	Outlet temperature from air heaters (SA)	degree C	247	
	Inlet temperature to the air	degree C	272	

Subsystem	Parameter	Units	Values	Remarks
	heaters (Flue gas)			
	Outlet temperature from air heaters (Flue gas)	degree C	136	
	Pressure at air heater inlet (PA)	mm WC	1850	100% MCR of 405 TPH
		mm WC	1823	92% MCR of 405 TPH
	Pressure at air heater outlet (PA)	mm WC	1667	100% MCR of 405 TPH
		mm WC	1665	92% MCR of 405 TPH
	Pressure at air heater inlet (SA)	mm WC	1116	100% MCR of 405 TPH
		mm WC	1089	92% MCR of 405 TPH
	Pressure at air heater outlet (SA)	mm WC	933	100% MCR of 405 TPH
		mm WC	931	92% MCR of 405 TPH
	Pressure drop across air heaters (PA circuit)	mm WC	183	100% MCR of 405 TPH
		mm WC	158	92% MCR of 405 TPH
	Pressure drop across air heaters (SA circuit)	mm WC	183	100% MCR of 405 TPH
		mm WC	158	92% MCR of 405 TPH
	Max gas velocity across tubes	m/s	7.6	100% MCR of 405 TPH
		m/s	7.0	92% MCR of 405 TPH
	Heat absorbed per kg of fuel	kCal	227.9	100% MCR of 405 TPH
		kCal	224.7	92% MCR of 405 TPH
PA fan	Primary air fan discharge pressure	mmWC	1967	100% MCR of 405 TPH
		mmWC	1922	92% MCR of 405 TPH
	Air heater inlet pressure (primary air)	mmWC	1850	100% MCR of 405 TPH
		mmWC	1823	92% MCR of 405 TPH
	Total Pressure drop in primary air circuit	mmWC	1074	100% MCR of 405 TPH
		mmWC	1021	92% MCR of 405 TPH

Subsystem	Parameter	Units	Values	Remarks
SA fan	Secondary air fan discharge pressure	mmWC	1244	100% MCR of 405 TPH
		mmWC	1195	92% MCR of 405 TPH
	Air heater inlet pressure (secondary air)	mmWC	1116	100% MCR of 405 TPH
		mmWC	1089	92% MCR of 405 TPH
	Total Pressure drop in secondary air circuit	mmWC	678	100% MCR of 405 TPH
		mmWC	616	92% MCR of 405 TPH
ID fan	Temperature at entrance to ID fan	degrees C	134	
	Temperature at exist of ID fan / entrance to stack	degrees C	136	
	Pressure drop between outlet cone of ESP and inlet of ID fan	mmWC	25.0	
	Pressure drop between outlet of ID fan and inlet of stack	mmWC	45.8	
Cyclone	Efficiency	%	99	
	Flue gas temperature	degrees C	816	For worst lignite
	Flue gas temperature at entrance to cyclones	degrees C	865	100% BMCR of 405 TPH
		degrees C	857	92% BMCR of 405 TPH
	Pressure drop across flue gas path	mmWC	14.7	In gas duct
	Max. gas velocity at cyclone inlet	m/sec	20	100% BMCR of 405 TPH
		m/sec	18	92% BMCR of 405 TPH
	Max. gas velocity at cyclone outlet	m/sec	32	100% BMCR of 405 TPH
		m/sec	29	92% BMCR of 405 TPH
	Percentage of oxygen in flue gases at cyclone exit	%	3.57	100% BMCR of 405 TPH
	Flue gas dust concentration before cyclone for worst lignite	N cum/sec	151.5	At 100% BMCR of 405 TPH
	Flue gas dust concentration after cyclone for worst lignite	N cum/sec	151.5	At 100% BMCR of 405 TPH
	Solid flow dust concentration before cyclone for worst lignite	Kg/sec.	2000	At 100% BMCR of 405 TPH

Subsystem	Parameter	Units	Values	Remarks
	Solid flow dust concentration after cyclone for worst lignite	Kg/sec.	30.3	At 100% BMCR of 405 TPH
	Dust concentration in dust load before cyclone for worst lignite	Kg/N cum	13.2	At 100% BMCR of 405 TPH
	Dust concentration in dust load after cyclone for worst lignite	Kg/N cum	0.2	At 100% BMCR of 405 TPH

Key process parameters of the existing ESP have been detailed below:

Parameter	Units	Values	Remarks
Flue gases Temperature at Entrance to ESP	degrees C	136	at 100% BMCR of 405 TPH
Treatment time	Sec	25	For performance lignite
	sec	21.4	For worst lignite
Average bus voltage	kV	43	
Max. gas velocity	m/sec	0.9412	
Precipitator efficiency when any one field is out of service	%	99.927	
Pressure drop across the precipitator/ bag filter	Mm WC	20	
Gas temp drop across precipitator/bag filter	degrees C	5 to 7	
Total power consumption	kW	207	
Dust emission at ESP/outlet	mg/N cum	150	Firing of worst lignite
	mg/N cum	130	Firing of performance lignite
Leakage distance in High tension support insulation	mm	370	
Minimum flash over in High tension support insulation	kV	110	
Primary voltage in ESP transformer	V	415	
Temperature rise above ambient temperature in ESP transformer	degrees C	50	

3. Context of RFP

3.1 Intent of specification

The intent of this specification is to carry out a complete Overhaul of the boiler and associated auxiliaries and retrofitting of the ESP according as the terms of reference / scope of work detailed in Part 2 of this document.

The Successful Bidder shall guarantee the performance parameters stipulated in Section 7.2 of Part 2 of this document towards successful execution and completion of the Overhaul.

The scope of work for the Overhaul shall include provision of services and supply of spares. Services shall include refurbishment, retrofitting, inspection of equipment, replacing, repairing, Overhauling, carrying out all pre-commissioning tests and or checks, trial runs, running performance tests of various equipment and systems covered under the specification, and any other work required to ensure sustainable performance of the system. Supply shall include procurement, inspection of material at suppliers' works, packing, transportation, machining, and installation of requisite spares for Overhaul of the boiler and associated auxiliaries and retrofitting of ESP.

The Successful Bidder shall conform in all respects to the highest standard of engineering, design, quality, and workmanship so that after completion of the Overhaul, the Plant shall be capable of operating safely, reliably, and sustainably in a manner acceptable to the owner.

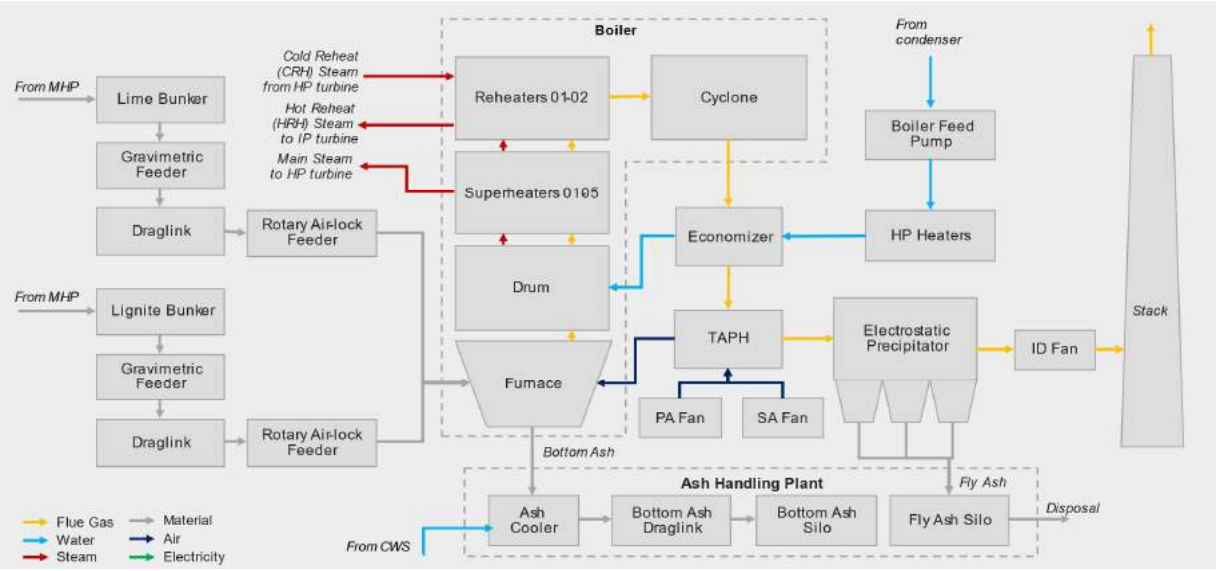
3.2 Battery limits

The Successful Bidder shall be responsible for maintenance and / or overhauling of all mechanical, electrical, and instrumentation equipment of the boilers and ESPs in Unit-1 and Unit-2, as part of the scope of work, as detailed in Part 2 of this document. This shall include all equipment within the following circuits as part of the boiler and ESP systems, as detailed below:

- Water and Steam Circuit: Starting from feed water regulatory valve and discharge of boiler feed pumps, up to main steam stop valve (MSSV) before HP turbine and reheater (RH) attemperator isolating valve
- Combustion Air Circuit: Starting from suction filter of SA Fans, PA Fans, Ash Cooler Fans, FA Fans up to the furnace
- Flue Gas Circuit: Starting from the furnace up to (and including) the chimney inlet, bellows, and the frame, including key systems such as TAPH, ID fans, etc.
- Lignite Feeding System: Starting (and including) from the inlet of the lignite bunker up to the furnace, including the draglink conveyor, gravimetric feeder, the rotary air-lock feeder, etc.
- Lime Feeding System: Starting (and including lime mill, lime conveying and storage system, needle gate valve) from the lime bunker up to the lignite rotary air lock feeder
- Ash Handling System: Starting from the outlet of the furnace up to (and including) the ash rotary seal, including the ash drag link, ash cooler, ash cooler fan (starting from SA fan discharge), closed hot water circuit, and the PHE
- Circulating Cooling Water Circuit: CCW lines for all fans and pumps, starting from the isolating valve in the inlet line to the isolating valve in the outlet line
- Fuel Oil (HFO) Circuit: Starting from the fuel oil unloading station to the main boiler burner, including the long recirculation circuit
- Diesel Oil (LDO) Circuit: Starting from the fuel oil unloading station to auxiliary boiler and the lime mill

Other equipment in the scope of this Package include:

- Field Instruments: All field instruments within the circuits mentioned above, including wiring up to junction boxes
- Auxiliary Boiler: Overhaul of the auxiliary boiler including associated equipment (e.g., pumps, fans, etc.)



Process flow diagram for Boiler – ESP

3.3 Plant visits

The Bidders are invited to visit the Plant and understand the equipment installed and their working conditions, prior to submission of the Bids. The objective of the Plant visits shall be to understand the scope of work, feasibility of execution, and make the Bidders fully conversant with the job, site conditions, constraints, and collect all information as required and as available before quoting against this specification.

The Bidders can schedule their visit to the Plant by providing prior intimation to the Owner (via e-mail) along with the list of visitors from the Bidding Entity to ensure ease of coordination and availability of key personnel.

The visits are optional, the Bidders can opt to visit the Plant at their own discretion. Should they opt to visit the Plant, the Bidder shall submit a Plant visit plan to the Owner indicating the timelines and the key personnel visiting, for prior consent and approval. The Owner shall facilitate the visits for the Bidders and make necessary arrangements at the Plant. The cost of the Plant visit, including transportation and accommodation, shall be borne by bidder.

3.4 Integration of equipment / system

Out of complete unit comprising of mechanical, electrical, and C&I systems, some components/systems are envisaged to be replaced with new ones having better design

features while some of the other components are to be refurbished / upgraded or repaired/ Overhauled by the Successful Bidder under the scope of work.

It shall be the responsibility of the Successful Bidder to ensure the components / equipment / systems being supplied, refurbished / upgraded, or repaired / Overhauled are fully integrated with the existing equipment / systems to get safe, reliable, and sustained operations of the Plant.

In this context, GMDC is looking for a Contractor for comprehensive Overhaul of the Boiler and ESP across both units of the Plant and is inviting Bids from bona fide and experienced Bidders of financial standing, reputation, and providing such services across India, for the following job:

Name of work:	Request for Proposal (RFP) for Boiler and ESP Package for Overhaul of GMDC's 250 (2x125) MW Akrimota Thermal Power Station (ATPS), Gujarat
RFP no.:	**GMDC/Power/ATPS/05/23-24**

Part 2: Terms of reference / Scope of Work

1. Definitions of the terms and conditions of the RFP

1.1. Definitions

For the purpose of the Contract, the following words and expressions in this Section shall have the respective meanings set forth below:

"**Applicable Laws**" shall mean all laws, treaties, ordinances, rules, regulations applicable in India and amendments, re-enactments, revisions, applications, and adaptations thereto made from time to time and in force and effect, judgments, decrees, injunctions, writs and orders of any court, arbitrator or governmental agency or authority, rules, regulations, orders and interpretations of any Governmental Instrumentality, court or statutory or other body having jurisdiction over construction of the Plant, performance of the Work or supply of Goods, operation and maintenance of the Plant, including Applicable Permits, as may be in effect at the time of performance of work or supply of Goods hereunder by the Bidder, which time would include Latent Defects Period as appropriate, provided, however, that if at any time the Applicable Laws are less stringent than the standards set forth in the Contract hereto, the standard set forth in the Contract hereto shall be deemed to be the standards under Applicable Laws.

"**Applicable Permits & Clearances**" shall mean any and all Permits, Clearances, Authorizations, consents, licenses (including without limitation any import or export licenses), lease, ruling, exemption, filing, agreements, or Approvals, required to be obtained or maintained in connection with construction of the Plant, performance of Work, and the operation of the Plant respectively by the Bidder and the Owner in accordance with the

Contract and their maintenance, as may be in effect at the time of Bidder's supply of Goods hereunder; which time would include Latent Defects Period as appropriate.

"**Approval**" shall mean the written approval of the Owner and of the statutory authorities, wherever such authorities are specified by any codes or otherwise.

"**Arbitration Act**" shall mean Arbitration and Conciliation Act, 1996, or any amendment or re-enactment thereof.

"**Authorization**" shall mean approvals required under Applicable Law.

"**Bid**" shall mean the offer of the Bidder to the Owner in response to the Bid Enquiry

"Bidder" shall mean single corporate entity Bidding for the Contract for overhauling of Boiler and ESP

"**Bidder Permits**" shall mean all Permits, required by the Bidder from any Government Instrumentality for the performance of his obligations.

"**Bidder's Representative**" shall mean the person named as such in the Contract or other person appointed and from time to time communicated to the Owner by the Bidder in his place in accordance with the terms of the Contract.

"**Bid Security/Earnest Money Deposit (EMD)"** shall mean the security provided by the Bidder to the Owner along with the Bid.

"**Commencement Date**" shall be the date 7 (seven) days from the date of signing of the LoA for services to be provided by the Bidder.

"**Contract**" shall mean the documents as set out in the form of Contract Agreement as may be amended, supplemented, or modified from time to time by agreement in Writing between the Parties.

"**Contract Period**" shall mean the period from the Commencement Date up to and including the last day of the Contract.

"**Documents**" shall mean and includes all design documents, engineering documents, Drawings, calculations, computer software (programs), computer media, samples, patterns, models, construction documents, erection documents, Operation and Maintenance Manuals, and other manuals, and the like as well as, all other data and information to be submitted by the Bidder and shall include without limitation, engineering, design and construction drawings, data sheets, specifications, plans, bills of Materials and estimates.

"**Governmental Authority**" shall mean the Government of India, the state government, any local authority constituted under an act of legislature, and any other authority exercising any power or function in pursuance of an act of legislature, or any rules and regulations made there under, and any successor thereof having legal jurisdiction over the matter or person in question.

"**Goods**" shall mean all of the equipment, machinery, apparatus, appliances, components and/or other Materials and things, which the Vendors are required to supply to the Owner under the Contract.

"**Good Industry Practice**" shall mean those practices, methods, acts, techniques and standards as may be followed or employed in the performance of the Work or supply of Goods and discharge of its obligations by the Bidder and which (i) are generally accepted internationally for use in the electric utility industry, taking into account conditions in India, in connection with power stations of the same or similar size and type as the Plant, (ii) are commonly used in prudent electric utility engineering, construction, project management and operations, and (iii) would be expected to result in performance of the Services and completion of Works in a manner consistent with Applicable Laws, Applicable permits, reliability and safety.

"**GUVNL**" shall mean Gujarat Urja Vikas Nigam Limited

"**Lumpsum Boiler and ESP Charges**" shall mean the comprehensive Boiler and ESP Overhaul charges payable by the Owner to the Bidder in respect of execution of all the services and supply of spares as indicated in Section 3 of Part 2 in this document.

"**Notice in Writing**" or "**Written Notice**" shall mean a Notice in Writing, typed, or printed or handwritten characters, sent (unless delivered personally or otherwise proved to have been received) by registered post or by electronic transmission to the last known private or business address or registered office of the addressee and shall be deemed to have been received when in the ordinary course of post or by electronic media it would have been delivered.

"Overhaul" shall refer to the planned maintenance being undertaken for the 2X125 MW Akrimota Thermal Power Station to enhance performance and reliability of the asset

"Overhauling Activities" shall refer to all the activities that are needed to be performed for successful Overhaul of the 2X125 MW Akrimota Thermal Power Station

"**Owner**" shall mean Gujarat Mineral Development Corporation Limited hereinafter referred to "GMDC", in its capacity as Owner and shall include its successors and assigns, as well as authorized officers.

"**Owner's Representative**" shall mean the person appointed by the Owner from time to time and notified as such to the Bidder to act as Owner's Representative for the purposes of the Contract.

"PMC" shall mean the Project Management Consultancy appointed by Authority / GMDC for providing PMC services for turnaround of GMDC's 2X125 MW Akrimota Thermal Power Station (ATPS)

"Package" shall mean a group of ATPS systems that are Packaged together for the execution of Overhaul

"**Party**" shall mean Owner or Bidder individually and "Parties" means Owner and Bidder collectively.

"**Personnel**" shall mean employees/personnel engaged by the Bidder who are based in India and are directly or indirectly engaged by the Bidder in the performance of the Bidder's obligations under this Agreement at the Plant.

"**Plant**" shall mean the 2X125 MW lignite based thermal power Plant operated by GMDC in Akrimota (Akrimota Thermal Power Station, ATPS), comprising of 2 units of 125 MW each

"Procurement Activities" shall mean the activities needed to be performed for Procurement of all the raw materials and services for Boiler and ESP Overhaul of the 2X125 MW Akrimota Thermal Power Station

"Successful Bidder" shall mean the Bidder who is selected by Authority / GMDC in providing services for Boiler and ESP Overhaul of GMDC's 2X125 MW Akrimota Thermal Power Station (ATPS) and shall include such Successful Bidder's legal representatives, successors and permitted assigns

"Turnaround" shall refer to the planned maintenance being undertaken for the 2X125 MW Akrimota Thermal Power Station to enhance performance and reliability of the asset

"**Willful Default**" shall mean an intentional or reckless breach or/ and omission by a Party of any of its obligations under the Contract

1.2. Interpretation

Words importing Persons or Parties shall include related firms and corporations and any organization having legal capacity. Words importing the singular also include the plural and vice versa where the context requires. Words importing one gender also include other genders.

Unless inconsistent with the provisions of the Contract, the meaning of any shipping terms and the rights and obligations of the Parties there under shall be as set forth in the latest International Chambers of Commerce (ICC) official rules for interpretation of trade terms as per "INCOTERMS 2010"

1.3. Law, language, and measurements

Applicable Law to this Contract shall be the Indian Law. The respective rights, privileges, duties and obligations of the Owner and the Successful Bidder under the Contract shall be governed and determined by the Laws of State and of the Republic of India.

All correspondence, information, literature, data, manuals, definitive documents, notices, waivers, and all other communication, written or otherwise, between the Parties in connection with this Contract shall be in English. The official text of this Contract shall be English.

All measurements shall be in metric system.

1.4. Stamp duty and similar charges

The costs of stamp duties and similar charges imposed by law on the Contract or Agreement, or any part thereof shall be borne by the Successful Bidder.

1.5. Commencement of Contract

The Successful Bidder, along with the payment of Performance Security, will enter into a Contract with the Owner on appropriate Stamp Paper (to be provided by the Successful

Bidder) in token of acceptance of the terms and conditions of the contract, within 7 (seven) days of submission of its acceptance of the Letter of Award (LOA). In case of any necessity arising after executing the Contract and during the execution of the work, which requires alteration/modifications in the Contract, the same can be made in writing by either party, after mutual understanding and consent of both the parties. The Successful Bidder will have to start the work as per the Scope of Work described in the Section 3 of Part 2 of this document, within 7 (seven) days from the date of acceptance of the LOA. In case of failure to commence the work within the abovementioned period, the liquidated damages shall be levied as per the provision of Section 9.1 of Part 2 of this document

1.6. Successful Bidder's use of Owner's documents

Copyright in the Owner's requirements and other Documents issued by the Owner to the Successful Bidder shall (as between the Parties) remain the property of the Owner. Ownership in all documents provided by the Successful Bidder to the Owner pursuant to the Contract including design, engineering, Drawings and Works layout (but excluding proprietary information and Manuals provided by Vendors of equipment for use of the Owner) shall vest in the Owner. The Successful Bidder may, at its Cost, copy, use and communicate any such documents for the purposes of the Contract. They shall not, without the Owner's consent, be used, copied, or communicated to a third-party by the Successful Bidder, except as necessary for the purposes of the Contract including performance of Work or supply of Goods.

The Successful Bidder shall indemnify the Owner in case of breach of this Section by the Successful Bidder. If these Documents are received by a third-party from the Successful Bidder and the third-party makes use of these Documents to cause harm or monetary loss to the Owner or use these Documents for their personal gain / monetary gain, the Successful Bidder shall compensate the Owner for the loss suffered as well as for the value of gain derived by third-party.

1.7. Confidential details

The Successful Bidder shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out his obligations hereunder. The Successful Bidder shall not publish, permit to be published, or disclose any particulars of the Contract in any trade or technical paper or elsewhere without the previous consent in writing of the Owner and at the Owner's sole discretion.

The Successful Bidder shall indemnify the Owner in case of breach of this Section. If the confidential details relating to this Contract or its contents are received by a third-party from the Successful Bidder and the third-party makes use of these details to cause harm or monetary loss to the Owner or use these Documents for their personal gain/ monetary gain, the Successful Bidder shall compensate the Owner for the loss suffered as well as for the value of gain derived by the third-party. The Successful Bidder shall not use the confidential details of the Contract for any other purpose except for the strict purpose of this Contract.

2. Appointment of Successful Bidder

2.1. Appointment terms

Based on the results of this Bid as per the evaluation criteria mentioned in Section 5 of Part 3 of this document, the Owner shall appoint the Successful Bidder, and the Successful Bidder shall accept the appointment to deploy skilled, qualified, and competent manpower, and necessary systems, infrastructure, equipment, spares, system, software, and tools as required for efficient execution of the Overhaul subject to the terms and conditions mentioned in the Contract.

The Owner reserves the right to increase or decrease the contractual work during the Contract period by giving prior notice in writing. Successful Bidder shall not be entitled to any compensation or indemnity on account of increase or decrease in the contractual work.

In case of requirement of execution of additional work as part of the scope of work detailed in Section 3 of Part 2 of this document during the Contract period, contractor shall be responsible to execute such additional work during the Contract period at the same rate finalized for the respective works. No escalation in the rate of the works for such additional work during the contract period shall be considered.

In case of a requirement of other works which are not covered in the scope of work detailed in Section 3 of Part 2 of this document, but the same is necessary for successful completion of the overhauling of the Boiler and ESP, the Successful Bidder may be assigned that work at the lowest rate derived and mutually agreed between the Successful Bidder and the Owner.

The MD is authorized to take suitable decision and action in case of requirement to amend/alter the contract conditions/quantities of the works/ extension of the contract period/allotment of additional works/revision of the rates of the work etc., if necessary, in the interest of the Owner.

2.2. Duration of the Contract

The Contract shall be deemed to have come into force and effect 7 (seven) days from the date of acceptance of the Letter of Award (LOA) by the Owner to the Successful Bidder and the Successful Bidder shall execute the scope of work for provision of services and supply of material as covered in Section 3 within a period of 45 weeks from the date of acceptance of LoA. In the said duration, the Successful Bidder shall complete the following key activities in the Package as per the stipulated timelines, where T shall mean the date of acceptance of the LOA:

S. No	Activity	Duration
1	Mobilization	T + 2 weeks
2	Completion of supplies for Auxiliary Boiler	T + 10 weeks
3	Overhauling and commissioning of Auxiliary Boiler	T + 16 weeks
4	Completion of supplies for both units for Boiler and ESP	T + 28 weeks
5	Completion of pre-Overhauling activities for both units	T + 28 weeks

S. No	Activity	Duration
6	Overhauling and commissioning of boilers across both units	T + 40 weeks
7	Retrofitting of ESPs across both units	T + 40 weeks
8	Completion of Performance Guarantee Testing for both units	T + 45 weeks

The Contract shall be deemed to be successfully executed post completion of the activities, as certified by competent authority from the PMC and Owner. The Successful Bidder shall strive to complete the execution within the stipulated period of 45 weeks, however, in case of a delay, the Successful Bidder shall ensure completion of its contractual obligations as early as possible, while the Owner reserves the right to levy penalties/liquidated damages as described in Section 9.1 of Part 2 of this document.

3. Responsibilities of the Successful Bidder

The responsibilities of the Successful Bidder as part of the Contract have been segregated into two key categories – services and supply. The terms of reference / scope of work have been detailed for each category below.

3.1. Scope of services

The scope of the Contract shall be providing end-to-end services for Overhaul of the Boiler and ESP both units of the Plant, as part of the Boiler and ESP package. The Successful Bidder shall ensure execution of the scope of work is done in accordance with best-in-class practices, standards of safety, and mutually agreed terms with the Owner.

3.1.1. Pre-Overhauling activities

3.1.1.1. Detailed Overhaul planning

1. The Successful Bidder shall create a detailed consolidated ‘Overhaul Execution Plan’ for the Boiler and ESP package in collaboration with the PMC, focusing on sequencing of activities, identification of interdependencies, and indicating clear milestones, in line with the timelines mentioned in Section 2.2 (Contract Duration) and Section 11.2 (Payment Milestones) of Part 2 of this document
2. The ‘Overhaul Execution Plan’ shall be used as the single source of truth for monitoring schedule compliance for the Successful Bidder, i.e., deviations in actual timelines vis-à-vis planned timelines
3. The ‘Overhaul Execution Plan’ shall be at an equipment level, encompassing all activities including but not limited to dismantling, inspecting, cleaning, repairing, installation, commissioning, and testing
4. The Successful Bidder shall prepare appropriate Quality Assurance Plan (QAP) or Quality Inspection Plan (QIP) and Quality Control Plan (QCP) for execution of the Overhaul and shall get it reviewed by competent authority from the PMC and the Owner. The Successful Bidder shall apprise the Owner about the plans to enable frequent audits, and highlight potential concerns, if any

5. The Successful Bidder shall prepare Boiler Overhaul and ESP Retrofitting protocols indicating the sequence of activities to be conducted along with set of readings to be measured before and after overhauling and retrofitting

3.1.1.2. Owner readiness assessment and support

1. The Successful Bidder shall, in collaboration with the PMC, conduct audits and physical verification of existing inventory at the Plant to identify the equipment and associated spares and material readily available to be utilized during the Overhaul.
2. Successful Bidder will assess the availability of required spares at the Plant. They will conduct a gap analysis and incorporate the additional material to be procured in the 'Procurement Register' (detailed in Section 3.2.1) to ensure optimal Procurement and consumption of material
3. The Successful Bidder shall assess the workshop equipment prior to the start of the Overhaul. The details of the equipment available in the workshop as on date has been summarized below:

S. No	Description	Make	Status
1	Precision Lathe (12 feet)	Panther	Working
2	Lathe machine (3 feet)	Esteem	Working
3	Piller Drilling Machine	Eifco	Working
4	Rough grinder	Eifco	Working
5	Power Hacksaw	Eifco	Working
6	Radial Drill Machine	HMT	Working

4. The Overhaul Plan created by the Successful Bidder shall mention requirement for equipment from the GMDC workshop. The Successful Bidder shall create an equipment usage plan in collaboration with PMC incorporating all interdependencies
5. The Successful Bidder shall be given access to the workshop equipment as per availability and Overhaul plan indicating requirement of workshop equipment. The Successful Bidder shall coordinate with the PMC to access the existing equipment and ensure no impact on execution timelines. If the Successful Bidder requires additional equipment to deliver the services defined in Section 3 of Part 2 of this document, the same shall be in the scope of the Successful Bidder
6. The Successful Bidder shall arrange and depute necessary operators as required for operating the workshop equipment

3.1.1.3. Statutory approvals

The Successful Bidder shall obtain, on behalf of the owner, all necessary statutory approvals from Inspection Authorities, IBR, or other government authorities, as may be required, as per Applicable Laws at its own cost. Further, the Successful Bidder shall coordinate and arrange for hydro testing of the boilers as per IBR requirements, during the course of the Overhaul.

All necessary documentation prepared and / or obtained for such statutory approvals shall be submitted to the Owner for review prior to submitting for approvals to relevant authorities. Coordination and liaising with competent authority are in the scope of Successful Bidder.

3.1.1.4. Workforce deployment

1. The Successful Bidder shall deploy a 'Boiler Package Leader' with strong technical expertise and experience of over 12 years, with prior experience in Overhauling, having successfully completed at least 2 EPC / ETC / R&M / Overhauling of CFBC Boilers in the last 12 years, in coal or lignite-based thermal power plants in India
2. Further, the Successful Bidder shall also deploy an 'ESP Package Leader' with strong technical expertise and experience of over 12 years, with prior experience in EPC / ETC / Retrofitting and commissioning of ESP units as per the latest environmental regulations (new emission standards vide notification no. S.O. 3305(E) dated 07th December 2015)
3. The 'Boiler Package Leader' and 'ESP Package Leader shall coordinate with the PMC and the Owner on all matters pertaining to the execution of the Overhaul
4. The minimum requirements for the Successful Bidder to ensure coverage of all equipment within the battery limits has been summarized below:

S. No	Member	Role	Minimum requirement	Minimum Qualification
1	Boiler Package Leader	Overall Boiler coordinator	1	Graduation in Mechanical / Electrical / Instrumentation / or equivalent Engineering (BE / B.Tech) with at least 12 years' experience
2	ESP Package leader	Overall ESP coordinator	1	Graduation in Mechanical / Electrical / Instrumentation / or equivalent Engineering (BE / B.Tech) with at least 12 years' experience
3	Mechanical Lead	Supervisor for mechanical activities	1	Graduation in Mechanical / Electrical / Instrumentation / or equivalent Engineering (BE / B.Tech) with at least 7 years' experience
4	Electrical Lead	Supervisor for electrical activities	1	
5	Instrumentation Lead	Supervisor for C&I activities	1	
6	Safety Lead	Supervisor for ensuring EHS (environment, health,	1	

S. No	Member	Role	Minimum requirement	Minimum Qualification
		and safety) activities		
7	Quality Head	Supervisor to ensure adherence with Quality Assurance Plan	1	Graduation in Mechanical / Electrical / Instrumentation / or equivalent Engineering (BE/B.Tech) with at least 7 years' experience

5. The Successful Bidder shall ensure that all deployed personnel are available at the Plant at all times during the execution of the Overhaul. The 'Boiler Package Leader' and 'ESP Package Leader' shall be present at the owner's corporate office in Ahmedabad for progress review and other meetings that may be organized during the course of the Overhaul, as needed. The Successful Bidder shall arrange for their own accommodation for representatives travelling to Ahmedabad for such meetings
6. The Successful Bidder shall submit details of all deployed personnel for execution of the Overhaul to the PMC prior to deployment and ensure they are in line with Contractual requirements
7. The Successful Bidder shall arrange for a sufficient number of IBR certified welders per day (with prior experience in welding of ASTM SA-106 Gr.B / SA-210 / SS304 / SS316 tubes) and other resources (e.g., fitters, grinders, etc.) for performing all welding activities and other tests as part of the Boiler and ESP package, as needed
8. The Successful Bidder should deploy sufficient workforce for simultaneous work on both the Boilers and ESPs at the Plant, in assurance with the 'Detailed Overhaul Plan', as detailed in Section 3.1 of Part 2 of this document
9. The Successful Bidder shall depute sufficient manpower for HR, Admin, Store management and HSE, as needed

3.1.1.5. Infrastructure arrangement

1. While the Owner will arrange for the accommodation and food for Successful Bidder's personnel deployed in the Plant on the basis of availability and on a chargeable basis, in case infrastructure is not available, the Successful Bidder shall be responsible for arranging the same for the entire course the Overhaul.
2. The Successful Bidder shall maintain a dedicated shed for conducting necessary works including but not limited to fabrication, repair, storage of material, etc. The Owner shall provide access to the available facilities and workshop in the Plant with prior written consent, as per availability
3. For timely and successful completion of the Overhaul, if new set of skilled operators are required for workshop equipment, the Successful Bidder shall arrange the same at its own cost

3.1.1.6. Structural modifications

The Successful Bidder shall be responsible for necessary structural modifications including supply, fabrication, and erection of any new structure to support piping, equipment, and provision of any additional platform if required for access to new equipment, or any other structural modification works required for execution of the Overhaul to aid the completion of the works defined in Section 3.1.2 of this document.

3.1.1.7. Hanger inspection and servicing

1. The Successful Bidder shall inspect all installed hangers, spring supports, flexible supports, rigid supports, etc. as per the battery limits defined in Section 3.2 of Part 1, and assess their load bearing capacities, prior to commencement of Overhaul. A detailed list of hangers available at the Plant has been appended in Annexure 4
2. The Successful Bidder shall replace all damaged / unsuitable / non-functional hangers, supports, and associated components, as needed for the execution of the Overhaul
3. The Successful Bidder shall be responsible for inspecting and repairing the existing boiler supports. As per design, the Boilers are top supported, however temporary fixed supports have been provided. The Successful Bidder shall replace all fixed supports with top supports as per design
4. The Successful Bidder shall be responsible for cold setting and hot setting of the hangers post commissioning and stabilization of the Boilers as per design

3.1.1.8. Scaffolding and platforms

Successful Bidder's scope shall include supply of all scaffolding, and / or platforms, as may be required for repair / Overhaul and commissioning. These items shall be specifically brought to the Plant solely for repair / Overhaul purpose and if no more needed for regular maintenance of the equipment, can however, be taken back by the Successful Bidder after completion of the work at the Plant.

3.1.1.9. Coil / Tube pulling equipment

The Successful Bidder shall be responsible for all coil / tube pulling arrangements, coil / tube supporting arrangements, required tools, chain blocks, pull lifts, slings, channels, and accessories required for the execution of the Overhaul.

3.1.1.10. Welding equipment

The Successful Bidder shall be responsible for arranging all welding machines, grinding machines, accessories for welding, cutting, grinding, along with consumables like 99.99% pure Argon gas, LPG, Oxygen, Acetylene, purging paper, grinding wheels, filler wires, welding rods, and other accessories required for the execution of the Overhaul.

The Successful Bidder shall arrange for welding rods of the following make only, as per IBR requirements, for welding of IBR lines. Copies of the approval certificates, obtained from the Director of Boiler, having validity for that batch of welding rods shall be furnished by the Successful Bidder to the PMC and the Owner, including the Manufacturer's test certificate indicating chemical composition and mechanical properties of the rods.

S. No	Specification	Rods to be used
1	Stainless steel Filler wire for 347H of size: 2.4 x 1000mm. AWS ER 347 stainless steel welding electrode of size: Dia. 2.5 / 3.15 mm conforming to AWS: E-347 Specification: 5.4	Bohler Thyssen/ Bohler/ Metrode (For SA 213 TP 347H Tube welding)
2	Filler wire AWS: ER 90S-B9, Size: 2.4 x 1000mm; Dia. 2.5/3.15mm Conforming to AWS E 9015-B9; SFA 5.5	BOHLER / METRODE. (For SA213-T91 Tube welding)
3	SS Welding Electrode AWS A5.4E309-16 OF SIZE: 2.5/3.15/3.20mm DIA	D&H SECHERON / ADOR / BOHLER / METRODE. (For 253 MA connector plate to SS pin welding)
4	SS Welding Electrode AWS A5.4E310 S OF SIZE:2.5/3.15/3.20mm DIA	D&H SECHERON / ADOR / BOHLER / METRODE. (For Insert plate welding)
5	Welding electrode E NiCrFe-3 DIA. 2.5/3.15mm	D&H SECHERON / ADOR / BOHLER / METRODE. (For SS connector pin welding with T91 pad)
6	Dia. 2.5 mm Conforming to AWS E 9015-B9; SFA 5.5	BOHLER (For SA213-T91 Tube welding)

3.1.1.11. Cranes

1. Since the Overhauling and retrofitting will be conducted on both Boilers and ESPs simultaneously, the Successful Bidder shall arrange for required cranes with skilled operator in the Boiler and/or ESP area, as required
2. The Successful Bidder shall be responsible for load testing and certification of cranes along with qualified crane operators available at the Plant prior to the start of the Overhaul, as applicable

3.1.1.12. Air compressors

Since the Overhauling and retrofitting will be conducted on both Boilers and ESPs simultaneously, the Successful Bidder shall arrange for portable air compressors for carrying out the works during the shutdown, as needed. The Successful Bidder shall arrange suitable cables, terminations/ joints for extending power from the existing source/ socket to portable compressors/ other power machines.

3.1.1.13. Consumables for Overhauling

The Successful Bidder shall be responsible for ensuring availability of sufficient quantities of all consumables for the Overhauling and retrofitting of Boiler and ESP Further, the Successful Bidder shall also ensure safe disposal of sewage and other wastes, as necessary, to ensure safe and clean operations.

3.1.1.14. Dismantling of existing equipment

1. The Successful Bidder shall be responsible for dismantling of existing equipment prior to the initiation of the Overhaul, as needed, including but not limited to the Boiler and ESP piping, insulation, refractory, supports, and other components
2. The Successful Bidder shall prepare a checklist for dismantling and list of readings to be taken at the time of dismantling and submit to competent authority from the PMC and the Owner for review
3. The Successful Bidder shall submit a floor plan for storing the dismantled Boiler and ESP components and submit it to the PMC for approval. The Successful Bidder shall ensure the components are appropriately stored in the area, as per the floor plan approved by the PMC, during the course of the Overhaul

3.1.1.15. Safety arrangements

1. The Successful Bidder shall ensure the personnel deployed in the Plant adhere to the appropriate health, safety, and environment (HSE) requirements at the time of deployment. This will include medical tests required, if any, among other requirements to be aligned with the Plant HSE team
2. The Successful Bidder shall make own arrangement for proper electrical grounding of all systems, supplied by him as required by the system design. All required accessories including grounding cables are also included in Successful Bidder scope
3. Safe power supply and illumination for confined places shall be arranged by the Successful Bidder. Any illumination work necessary to fulfill the scope of services defined in this RfP shall be carried out by the Successful Bidder prior to the start of other work
4. A single point electrical supply of 415V, 32/63 Amp 3 phase and single point electrical supply of 230V, 16 Amp single phase power supply point from nearest available healthy source shall be supplied to the Successful Bidder by the Owner, free of cost. The Successful Bidder shall be responsible for the provision of cables for extending power to its apparatus
5. The Successful Bidder shall be solely responsible for ensuring the safety of the adjacent equipment / foundations and of the existing supporting structures. The Overhauling work by the Successful Bidder shall be carried out in such a manner that no damage is caused to existing equipment / foundations / structure and all precautions, including strengthening of existing structures, as may be necessary,

shall be taken by the Successful Bidder to ensure safety of existing Plant / equipment / foundation / structures

3.1.1.16. Permits

1. The Successful Bidder shall obtain and maintain in effect all applicable Contractor permits required in connection with the Successful Bidder's performance of its obligations hereunder, including but not limited to licenses to permit the Successful Bidder to do business in the jurisdictions where the work is to be performed, design, engineering, procurement, fabrication, construction, erection, testing and commissioning, start-up testing, tests before taking-over, export, import, and other applicable permits required to move, transport, and deliver material / equipment to and fro from the Plant
2. Successful Bidder shall obtain all necessary Contractor and Construction permits. If the Successful Bidder at any time becomes aware, whether as a result of notice from Owner or otherwise, of any applicable permit not obtained by him, the Successful Bidder shall promptly give notice thereof to Owner and the Successful Bidder shall be responsible for obtaining such applicable Permits
3. The Successful Bidder shall provide support to the owner in obtaining necessary Owner's permits, including but not limited to the following activities:
    i. Overall co-ordination of permitting requirements
    ii. Attendance at meetings with Owner and third parties designated by Owner
    iii. Preparation of permit applications or, as applicable, application to transfer permits to the Owner
    iv. Assistance in preparation of responses to inquiries by governmental instrumentalities/ agencies
    v. Assistance in presentations at hearing of governmental instrumentalities / agencies
    vi. Provision of all available information and documents required by Owner in connection with obtaining any Owner Permits; and
    vii. Such other services as Owner may request from time to time required for Owner permits

3.1.2. Overhauling activities (Boiler)

The Successful Bidder shall prepare a comprehensive list of activities to be undertaken during the Overhaul post completion of inspection of the Boiler, as part of the 'Overhaul Execution Plan', detailed in Section 3.1.1.1 of Part 2 of this document.

3.1.2.1. Measurement of parameters

The Successful Bidder shall prepare a list of all parameters to be measured prior to initiation of the Overhaul and post completion of the Overhaul. The Successful Bidder shall validate the list with competent authority from the Owner and the PMC and obtain approvals prior to initiation of the Overhaul. For measurement of the parameters, the Successful Bidder shall use the existing instrumentation installed at the Plant and highlight to the PMC and the Owner in case of any issues.

The Successful Bidder shall be responsible for measurement of all essential parameters, prior to overhauling of the Boiler, while dismantling as per Section 3.1.1.14. The Successful Bidder shall maintain a log of all the readings to be furnished to the competent authority from the PMC and the Owner

The Successful Bidder shall ensure that the readings observed post inspection, maintenance, and assembly of the Boiler are at par or better than the readings measured prior to dismantling. In case of deviations, the Successful Bidder shall furnish appropriate documental evidence justifying the deviations. The desired outcomes have been incorporated in Section 7 of Part 2 of this document.

3.1.2.2. Dismantling and cleaning

The Successful Bidder shall be responsible for dismantling of the Boiler components, storage of dismantled components in the areas earmarked by the PMC, and cleaning of the equipment with appropriate tools and safety precautions, prior to inspection of the components.

3.1.2.3. Overhaul plan

The Successful Bidder shall be responsible for performing comprehensive Overhaul of the Boiler. The list of activities to be carried out, across all key components, have been detailed below as Plan 1 to 16. The key activities across all plans have been classified into two categories, as per the following definitions:

Category 1: Services required across key components to be undertaken as part of the Overhaul. Any additional services and procurement of associated material (i.e., not detailed as part of the Contract) for components classified as Category A identified during inspections post the initiation of the Overhaul, shall be notified to competent authority from the PMC and the Owner, and shall go through the 'Rate Settlement Mechanism', as detailed in Section 6 of Part 2 of this document.

Category 2: Services required for replacement of tubes and application of refractory across the boilers as per tentative quantities defined in Annexure 2. Services required for additional quantities of tubes or refractory shall be notified to the competent authority from the PMC and the Owner and shall go through the 'Quantity Variance Mechanism' defined in Section 5.2 of Part 2 of this document.

Plan 1: Auxiliary Boiler

The key activities to be executed by the Successful Bidder for repair / overhaul of the auxiliary boiler shall include, but not be limited to, the following. The indicative list of spares to be procured for the auxiliary boiler have been detailed in Annexure 2, Plan 1.

Further, the Successful Bidder shall prioritize the procurement and execution of the overhaul of the auxiliary boiler (as per timelines defined in Section 2.2), to ensure successful completion prior to shutdown of the units.

Component	Activity	Unit	Cat 1	Cat 2

Component	Activity	Unit	Cat 1	Cat 2

Tubes	– Cutting and removal of old tubes, supply, installation, and commissioning of new tubes in the waterwall (1264 Nos) and superheater panel (54 Nos) as per the specifications detailed in Annexure 2, Plan 1, including the following:
	  – Non-destructive testing of new welded joints
	  – Leak test
	  – Hydro test up to 32 kg/m^2
	  – Arrest leakages
	– Submission of test certificates for MOC of tubes to the Owner
		Common	✓	

Drum	– Drum surface preparation for new tube installation – Drum level checking and correction – Replacement of drum vent line (supply of drum vent line in Owner's scope)	Common	✓	
Baffle plates	– Supply, installation, and commissioning of baffle plates as per the specifications detailed in Annexure 2, Plan1	Common	✓	
Cover plates	– Cutting and removal of cover plates and breaking of refractory – Cover plate welding and cladding application	Common	✓	
Insulation and coils	– Supply and apply insulation and coils across the Auxiliary Boiler as per specifications detailed in Annexure 2, Plan 1	Common	✓	
Valve	– Supply and apply gate valve at Start up vent and MS Line	Common	✓	
Refractory	– Installation of brick lining and application of refractory at burner mouth	Common		✓
Field instruments	– Inspection, testing, and calibration of existing field instruments associated with the Auxiliary Boiler – e.g., flow control valves, pressure gauges, thermocouples, etc.	Common	✓	
	– Removal and re-installation of all field instruments post testing and calibration	Common	✓	
Hydro testing	– Collaboration with relevant authority from IBR for inspection, and hydro testing of the Auxiliary Boiler, prior to initiation of operations and shutdown of the Plant	Common	✓	

Plan 2: Ash handling system

The key activities to be executed by the Successful Bidder for repair / overhaul of the ash handling system shall include, but not be limited to, the following. The

indicative list of spares to be procured for the ash handling system have been detailed in Annexure 2, Plan 2.

Component	Activity	Unit	Cat 1	Cat 2
Bottom ash draglink	– Supply, replacement, and commissioning of bottom ash draglink	Unit 1 and 2	✓	
Ash cooler	– Supply and install MS plates, SS310 plates, and baffle plate assembly as per specifications in Annexure 2, Plan 2	Unit 1 and 2	✓	
	– Inspection and cleaning of nozzles	Unit 1 and 2	✓	
	– Inspection and replacement of liner plate	Unit 1 and 2	✓	
	– Inspection of L-valve refractory and repair if required	Unit 1 and 2	✓	
	– Dismantling of air dock feeder and inspection of internals replacement/repair if required	Unit 1 and 2	✓	
Ash cooler recirculation bellow	– Supply and install non-metallic bellows and MS plates as per specifications in Annexure 2, Plan 2	Unit 1 and 2	✓	
Ash cooler sea water line	– Supply and install SS 316L and MS/GI pipelines for sea water into ash cooler	Unit 1 and 2	✓	
Ash rotary seal	– Supply and replace ash rotary seal	Unit 1 and 2	✓	
Ash draglink conveyer	– Supply and replace chain link and flight	Unit 1 and 2	✓	
	– Supply of spares for ash draglink as per Annexure 2, Plan 2	Unit 1 and 2	✓	
Refractory	– Supply and apply LCC50, 11 Li, and LCC 80 GN refractory as per Annexure 2, Plan 2	Unit 1 and 2		✓

Plan 3: Non-pressure parts (Boiler)

The key activities to be executed by the Successful Bidder for repair / overhaul of the Boiler non-pressure parts shall include, but not be limited to, the following. The indicative list of spares to be procured for the Boiler non-pressure parts have been detailed in Annexure 2, Plan 3.

Component	Activity	Unit	Cat 1	Cat 2
Loop seal bellow	– Supply and replace metallic bellows	Unit 1 and 2	✓	
Burners	– Inspect and repair burner tips and lance (long and short), replace if needed	Unit 1 and 2	✓	

Component	Activity	Unit	Cat 1	Cat 2
Level gauge	– Inspect and clean level gauge glasses, replace if needed	Unit 1 and 2	✓	
Plate-type heat exchangers	– Inspect EPDM gaskets, studs with double nuts for PHE, replace if needed	Unit 1 and 2	✓	
Refractory	– Removal of existing refractory in the boilers	Unit 1 and 2	✓	
	– Supply and apply LCC 80 / LCC 80 GN / 11 Li refractory for loop seal return leg and syphon seal	Unit 1 and 2		✓

Plan 4: Pressure parts (Boiler)

The key activities to be executed by the Successful Bidder for repair / overhaul of the Boiler pressure parts shall include, but not be limited to, the following. The indicative list of spares to be procured for the Boiler pressure parts have been detailed in Annexure 2, Plan 4.

Component	Activity	Unit	Cat 1	Cat 2
Furnace	– Supply and replace furnace nozzles, waterwall, evaporator bottom tubes as per specifications detailed in Annexure 2, Plan 4	Unit 1 and 2	✓	
	– Build up removal and tube coating for tubes in RTZ area	Unit 1 and 2	✓	
	– Inspect, clean, and/or repair screen tubes with protectors, replace if needed	Unit 1 and 2	✓	
	– Inspect, supply, and replace furnace bed tubes, furnace tubes, evaporator tubes, evaporator intermediate wall tubes, superheater tubes, and reheater tubes as per observations identified during the RLA and specifications detailed in Annexure 2, Plan 4	Unit 1 and 2		✓
	– Implement observations identified as part of Boiler RLA	Unit 1 and 2		✓
Drum	– Open manholes and inspect	Unit 1 and 2	✓	
	– Dismantle and remove drum internals	Unit 1 and 2	✓	
	– Clean and inspect drum internals	Unit 1 and 2	✓	
	– Clean drum inside surface area	Unit 1 and 2	✓	

Component	Activity	Unit	Cat 1	Cat 2
	– Replace damaged internals and fasteners – Assemble drum internals	Unit 1 and 2	✓	
	– Change manhole gasket and Box-up	Unit 1 and 2	✓	
	– Conduct hydro testing	Unit 1 and 2	✓	
2nd pass	– Supply and replace 2nd pass inlet bellow	Unit 1 and 2	✓	
	– Inspect, supply, and replace economizer section tubes, 2nd pass upper hanger tubes (SH1), 2nd pass lower hanger tubes (SH2), front wall tubes (SH1), LH/RH side wall tubes (SH2), rear wall tubes (SH3), superheater (SH3, SH5) tubes, and reheater (RH1) tubes as per observations identified during the RLA and specifications detailed in Annexure 2, Plan 4	Unit 1 and 2		✓
	– Supply and apply insulation and aluminum coil as per specifications detailed in Annexure 2, Plan 4	Unit 1 and 2	✓	
	– Open all manholes	Unit 1 and 2	✓	
	– Clean heating surface with hot water / wire brush	Unit 1 and 2	✓	
	– Inspect heating surface for bulging/ warping / erosion / overheating etc.	Unit 1 and 2	✓	
	– Check binders, lugs, etc. for super heater / reheater coils	Unit 1 and 2	✓	
	– Inspect, clean, and reweld manhole plates	Unit 1 and 2	✓	
	– Hydro jetting of 2nd pass	Unit 1 and 2	✓	
	– Box-up post inspection, rectification, and installation of new components	Unit 1 and 2	✓	
	– Conduct hydro testing	Unit 1 and 2	✓	
Economizer / LTSH	– Open all manholes	Unit 1 and 2	✓	
	– Clean heating surface with hot water / wire brush	Unit 1 and 2	✓	
	– Clean hoppers and discharge pipe and check supports	Unit 1 and 2	✓	
	– Box-up post inspection, rectification, and installation of new components	Unit 1 and 2	✓	

Component	Activity	Unit	Cat 1	Cat 2
	– Conduct hydro testing	Unit 1 and 2	✓	
RTZ area	– Supply and replace RTZ area tubes as per specifications detailed in Annexure 2, Plan 4	Unit 1 and 2	✓	
Pipelines	– Supply and apply insulation and aluminum coil as per specifications detailed in Annexure 2, Plan 4	Unit 1 and 2	✓	
Soot blower	– Supply and replace soot blowers for TAPH	Unit 1 and 2	✓	
	– Supply and replace soot blower for HRSB	Unit 1 and 2	✓	
	– Supply of lance tubes for soot blowers	Unit 1 and 2	✓	
	– Lubrication of soot blower (oil/grease), as needed	Unit 1 and 2	✓	
	– Supply of spares for LRSB, HRSB, rotary soot blowers	Unit 1 and 2	✓	
	– Servicing and repair of SBV head assembly, with checks for erosion of seat/disc/stem	Unit 1 and 2	✓	
	– Clean and inspect rack/pinion assembly for wear and damage check alignment and lubricate	Unit 1 and 2	✓	
	– Service rotary/traverse gearboxes	Unit 1 and 2	✓	
	– Inspect S.B. tube for crack/damage and clean nozzle	Unit 1 and 2	✓	
	– Replace Swivel tube bushing if required	Unit 1 and 2	✓	
	– Service traveling carriage assembly. Dismantle and inspect work, worm gear and bearings	Unit 1 and 2	✓	
	– Service power pack assembly	Unit 1 and 2	✓	
	– Dismantle clutch assembly for free and easy operation	Unit 1 and 2	✓	
	– Check chain tension. Service actuating lever and striking bolt etc.	Unit 1 and 2	✓	
	– Adjust limit switches during trial run for correct advance/retract	Unit 1 and 2	✓	
SWAS	– Supply and replace primary SWAS coolers for samples	Unit 2	✓	
	– Install MS lines for SWAS coolers	Unit 1 and 2	✓	

Component	Activity	Unit	Cat 1	Cat 2
Air lines	– Inspect, supply, and replace 50 NB air lines across the furnace / 2nd pass	Unit 1 and 2	✓	
Refractory	– Remove existing refractory in the boilers	Unit 1 and 2	✓	
	– Supply and apply LCC 50 refractory of LH/RH sides, rear, and front walls	Unit 1 and 2		✓

Plan 5: Cyclone

The key activities to be executed by the Successful Bidder for repair / overhaul of the cyclone shall include, but not be limited to, the following. The indicative list of spares to be procured for the cyclone have been detailed in Annexure 2, Plan 5.

Component	Activity	Unit	Cat 1	Cat 2
Cyclone	– Supply and refurbishment of MS plates cylindrical and in conical area for the cyclones – Supply and apply brick lining for the cyclone refractory – Supply and apply insulite across the cyclone	Unit 1 and 2	✓	
Vortex	– Supply and refurbishment of 10 mm SS310 and 8 mm MS plates for the shell – Supply and install anchors across the vortex	Unit 1 and 2	✓	
Bellows	– Supply and replace inlet and outlet bellows in the cyclone as per specifications detailed in Annexure 2, Plan 5	Unit 1 and 2	✓	
Refractory	– Remove existing refractory in the cyclones	Unit 1 and 2	✓	
	– Supply and apply refractory for top roof, inlet long wall, inlet short wall, inlet top wall, shell, COD, cyclone outlet, and cyclone downcomer as per specifications detailed in Annexure 2, Plan 5 – Supply and apply mortar for the shell – Supply and install anchors for refractory, shell, and furnace	Unit 1 and 2		✓
Insulation	– Supply and install aluminum sheet and insulation material for the shell	Unit 1 and 2	✓	

Plan 6: Dampers and gates

The key activities to be executed by the Successful Bidder for repair / overhaul of dampers and gates shall include, but not be limited to, the following. The indicative list of spares to be procured for the dampers and gates have been detailed in Annexure 2, Plan 6.

Component	Activity	Unit	Cat 1	Cat 2
ID fan inlet and outlet dampers	– Supply and replace guillotine dampers for ID fan inlet and outlet – Supply and replace seal strips for dampers at ID fan inlet and outlet	Unit 1 and 2	✓	
PA and SA fan control dampers	– Supply and replace bearings for PA and SA fan control dampers	Unit 1 and 2	✓	
Guillotine gates	– Supply and replace guillotine gates for ID fans	Unit 1 and 2	✓	
General activities	– Servicing of actuators. Replacement of worn-out parts.	Unit 1 and 2	✓	
	– Checking/repair or replacement of gates/ damper leaves/shaft and bearings etc.	Unit 1 and 2	✓	
	– Repack glands with new packing	Unit 1 and 2	✓	
	– Checking of seal airline system	Unit 1 and 2	✓	
	– Check and ensure smooth operation of dampers/gates. Check and calibrate damper position marking.	Unit 1 and 2	✓	

Plan 7: Ducts

The key activities to be executed by the Successful Bidder for repair / overhaul of ducts shall include, but not be limited to, the following. The indicative list of spares to be procured for the ducts have been detailed in Annexure 2, Plan 7.

Component	Activity	Unit	Cat 1	Cat 2
Fan ducts	– Supply and install fan ducts for PA, SA, and ID fans as per specifications in Annexure 2, Plan 7	Unit 1 and 2	✓	
Insulation	– Supply and install insulation material for the PA, SA, and ID fans as per specifications in Annexure 2, Plan 7	Unit 1 and 2	✓	
Coils	– Supply and install Aluminum coil for cladding for the PA, SA, and ID fans as per specifications detailed in Annexure 2, Plan 7	Unit 1 and 2	✓	
Bellows	– Supply and install ID outlet and suction bellow	Unit 1 and 2	✓	
General activities *(across ducts)*	– Cleaning/inspection/repair of duct	Unit 1 and 2	✓	
	– Check all safety explosion rupture sheets provided in the duct	Unit 1 and 2	✓	
	– Check and repair duct internal support	Unit 1	✓	

Component	Activity	Unit	Cat 1	Cat 2
	pipes and stiffeners	and 2		
	– Cleaning and inspection of TAPH	Unit 1 and 2	✓	
	– Cleaning/inspection/repair or replacement of expansion joint	Unit 1 and 2	✓	
	– Painting of duct inside as required	Unit 1 and 2	✓	
	– Inspection of nonmetallic expansion joints of PA Wind box	Unit 1 and 2	✓	
	– Repair of crack in wind box ducts	Unit 1 and 2	✓	

Plan 8: Fans

The key activities to be executed by the Successful Bidder for repair / overhaul of the fans shall include, but not be limited to, the following. The indicative list of spares to be procured for the fans have been detailed in Annexure 2, Plan 8.

Component	Activity	Unit	Cat 1	Cat 2
SA fans	– Cleaning and inspection of impeller assembly.	Unit 1 and 2	✓	
	– Servicing and replacement of blade bearings, sealing elements etc. Adjustment of aerofoil	Unit 1 and 2	✓	
	– Check position and fixation of Compensating weights.	Unit 1 and 2	✓	
	– Servicing of guide vanes	Unit 1 and 2	✓	
	– Servicing of Servomotor	Unit 1 and 2	✓	
	– Inspection/servicing or replacement of fan bearings	Unit 1 and 2	✓	
	– Checking/repair of suction/discharge duct	Unit 1 and 2	✓	
	– Assembly of fan with specified clearances as per maintenance Q.A. Sheet.	Unit 1 and 2	✓	
	– Alignment of fan and coupling with motor	Unit 1 and 2	✓	
	– Servicing of lube oil pumps.	Unit 1 and 2	✓	
	– Cleaning of L.O. tank/filters/piping/valves etc. and repair/replacement of damaged parts	Unit 1 and 2	✓	

Component	Activity	Unit	Cat 1	Cat 2
	– Cleaning and hydro test of L.O. Coolers	Unit 1 and 2	✓	
	– Servicing of C.W. piping & valves.	Unit 1 and 2	✓	
	– Alignment of L.O. pump and coupling with motor	Unit 1 and 2	✓	
	– Rebabbitting of bearing	Unit 1 and 2	✓	
	– Supply of suction silencer, impeller, and shafts as per specifications in Annexure 2, Plan 8	Unit 1 and 2	✓	
	– Reconditioning of fan	Unit 1 and 2	✓	
	– Trial run and re-commissioning of L.O. system	Unit 1 and 2	✓	
	– Trial run of fan and dynamic balancing	Unit 1 and 2	✓	
PA fans	– Rebabbitting of bearing	Unit 1 and 2	✓	
	– Supply of suction silencer, impeller, and shaft as per specifications in Annexure 2, Plan 8	Unit 1	✓	
	– Check impeller weld joints by DPT for cracks	Unit 1 and 2	✓	
	– Servicing of regulating vanes	Unit 1 and 2	✓	
	– Servicing of guide vane actuator and lubrication of linkage etc.	Unit 1 and 2	✓	
	– Checking/repair of suction/discharge duct	Unit 1 and 2	✓	
	– Assembly of fan with specified clearances as per maintenance Q.A. sheets.	Unit 1 and 2	✓	
	– Alignment of fan and coupling with motor	Unit 1 and 2	✓	
	– Servicing of lube oil pump	Unit 1 and 2	✓	
	– Cleaning and repair of L.O. tank/filters/piping/valves/ etc.	Unit 1 and 2	✓	
	– Cleaning and hydro test of L.O. Coolers	Unit 1 and 2	✓	
	– Servicing of C.W. Piping & Valves.	Unit 1 and 2	✓	
	– Alignment of L.O. pump and coupling	Unit 1	✓	

Component	Activity	Unit	Cat 1	Cat 2
	with motor	and 2		
	– Trial run and recommissioning of L.O. system	Unit 1 and 2	✓	
	– Trial run of fan and dynamic balancing	Unit 1 and 2	✓	
ID fans	– Cleaning and inspection of impeller. Checking of weld joints by DPT	Unit 1 and 2	✓	
	– Cleaning and inspection of diffuser and cone	Unit 1 and 2	✓	
	– Checking of shaft protection tube	Unit 1 and 2	✓	
	– Servicing of Inlet guide vane/ actuators, lubrication of IGV control mechanism for free operation	Unit 1 and 2	✓	
	– Servicing of Outlet guide vanes and repair as required	Unit 1 and 2	✓	
	– Check shaft condition and run out	Unit 1 and 2	✓	
	– Checking/repair of suction/duct	Unit 1 and 2	✓	
	– Assembly of fan with specified clearances as per maintenance Q.A. sheets.	Unit 1 and 2	✓	
	– Alignment of fan and coupling with motor	Unit 1 and 2	✓	
	– Servicing of lube oil pump	Unit 1 and 2	✓	
	– Cleaning of L.O. tank/filters/piping valves etc.	Unit 1 and 2	✓	
	– Cleaning and hydro test of L.O. Coolers	Unit 1 and 2	✓	
	– Servicing of C.W.piping/Valves	Unit 1 and 2	✓	
	– Alignment of L.O. pump and coupling with motor	Unit 1 and 2	✓	
	– Rebabbitting of journal bearing	Unit 1 and 2	✓	
	– Supply of impeller and shaft as per specifications in Annexure 2, Plan 8	Unit 1 and 2	✓	
	– Trial run and recommissioning of L.O. system	Unit 1 and 2	✓	
	– Trial run of I.D. fan and dynamic balancing	Unit 1 and 2	✓	

Component	Activity	Unit	Cat 1	Cat 2
Ash cooler fans	– Supply of impeller and shaft as per specification in Annexure 2, Plan 8	Unit 2	✓	
Insulation	– Supply and install insulation material as per specifications in Annexure 2, Plan 8	Unit 1 and 2	✓	
Coils	– Supply and install Aluminium coil for cladding as per specifications detailed in Annexure 2, Plan 8	Unit 1 and 2	✓	

Plan 9: Hangers and supports

The key activities to be executed by the Successful Bidder for repair / overhaul of the hangers and supports shall include, but not be limited to, the following. The indicative list of spares to be procured for the hangers and supports have been detailed in Annexure 2, Plan 9.

Component	Activity	Unit	Cat 1	Cat 2
Internal pipe supports	– Inspect and repair / replace internal pipe supports, as detailed in Annexure 3, including remedial actions as per observations from the RLA	Unit 1 and 2	✓	
External pipe supports	– Inspect and repair / replace external pipe supports, as detailed in Annexure 3, including remedial actions as per observations from the RLA	Unit 1 and 2	✓	
Soot blower, reheater, economizer drains	– Inspect and repair / replace hangers/supports for soot blower, reheater, economizer drains as detailed in Annexure 3, including remedial actions as per observations from the RLA	Unit 1 and 2	✓	
Air and flue gas ducts	– Inspect and repair / replace hangers and supports for air and flue gas ducts as detailed in Annexure 3, including remedial actions as per observations from the RLA	Unit 1 and 2	✓	
Cyclone	– Inspect and repair / replace cyclone as detailed in Annexure 3, including remedial actions as per observations from the RLA	Unit 1 and 2	✓	

Plan 10: HFO and LDO systems

The key activities to be executed by the Successful Bidder for repair / overhaul of the HFO and LDO systems shall include, but not be limited to, the following. The indicative list of spares to be procured for the HFO and LDO systems have been detailed in Annexure 2, Plan 10.

Component	Activity	Unit	Cat 1	Cat 2
Fuel oil firing system	– Clean oil gun tips, inspect, and replace, as needed	Common	✓	
	– Clean oil hoses, inspect, and replace, as needed	Common	✓	
	– Service gun advance/retract mechanism	Common	✓	

Plan 11: Lignite feeding system

The key activities to be executed by the Successful Bidder for repair / overhaul of the Lignite feeding system shall include, but not be limited to, the following. The indicative list of spares to be procured for the Lignite Dosing System have been detailed in Annexure 2, Plan 11.

Component	Activity	Unit	Cat 1	Cat 2
Gravimetric feeder	– Inspect and repair gravimetric feeder including feeder belts, fasteners, MSRT machine, belt side wall (rib), gearbox, head pulley, tail pulley, carrying rollers with bearings, return rollers with bearings, NDE bearing, bunker gate, pinion, output wheel, rack angle, circlip, spacer, COC link assembly (with and without flight), guide plates, sprockets, COC bearings, and MS pipes – Replace critical items post inspection, if needed	Unit 1 and 2	✓	
Lignite draglink conveyor	– Inspect and repair lignite draglink conveyor including chain link assembly, gearbox, guide plates, sprockets, drive chain, forkey sprocket, sleeves, tail pulleys, bearings, manual gates, and glands – Replace critical items post inspection, if needed	Unit 1 and 2	✓	
Lignite rotary air lock feeder	– Inspect and repair gearbox, RALF bellows, manual gates, pipe for inlet chute, bearings, timing gears, glands, etc. – Lubricate / grease critical moving components – Replace critical items post inspection, if needed	Unit 1 and 2	✓	
General activities	– Close lignite bunker gate and clean feeder	Unit 1 and 2	✓	
	– Check bunker condition from inside	Unit 1 and 2	✓	
	– Check condition of liner	Unit 1 and 2	✓	

Component	Activity	Unit	Cat 1	Cat 2
	– Replace the defective liners	Unit 1 and 2	✓	
	– Check the conditions of links of lignite feeder check all the joints for any looseness	Unit 1 and 2	✓	
	– Check bearing clearance and check MFT gates	Unit 1 and 2	✓	

Plan 12: Lime dosing system

The key activities to be executed by the Successful Bidder for repair / overhaul of the Lime dosing system shall include, but not be limited to, the following. The indicative list of spares to be procured for the Lime dosing system have been detailed in Annexure 2, Plan 12.

Component	Activity	Unit	Cat 1	Cat 2
Bag filters	– Supply and install bag filters	Unit 1 and 2	✓	
Screw pump	– Supply and install bearings	Unit 1 and 2	✓	
Compressors	– Supply and install cylinders, ovel flanges, gaskets, cover, valve, stud, nut hex, gland, v belt, oil filter, water flow indicator, and air filter	Unit 1 and 2	✓	
Compressor belts	– Supply and install belts	Unit 1 and 2	✓	
Mill ball	– Supply and install mill balls	Unit 1	✓	
L-valves	– Supply and install balls	Unit 1	✓	
Compressor NRV	– Supply and install MRV	Unit 1 and 2	✓	
Mill gearbox	– Supply and install coupling	Unit 2	✓	
Chain conveyors	– Supply and install chain link and guide plate	Unit 2	✓	
DE / NDE pumps	– Supply and install pump	Unit 2	✓	
Main gearbox pumps	– Supply and install pump	Unit 2	✓	
Dilution blower	– Supply and install belts	Unit 2	✓	
HAG burner	– Supply and install gun	Unit 2	✓	
Ball valves	– Supply and install ball	Unit 2	✓	

Component	Activity	Unit	Cat 1	Cat 2
Bag filter compressor	– Supply and install air filter, oil filter, gear wheel and pinion, spacers, bolts, anti-vibration pads, damper, valves, display, sensor, harness, transducer, seal ring and oil separator	Unit 2	✓	
Lime compressor	– Supply and install lime conveying system compressor	Unit 2	✓	

Plan 13: Tubular air pre-heater (TAPH)

The key activities to be executed by the Successful Bidder for repair / overhaul of the TAPH shall include, but not be limited to, the following. The indicative list of spares to be procured for the TAPH have been detailed in Annexure 2, Plan 13.

Component	Activity	Unit	Cat 1	Cat 2
TAPH	– Supply and install tubes – Supply and install SS plate for bellows and pipe – Supply and install insulation and aluminum coil for cladding – Hydro jetting	Unit 1 and 2	✓	
	– Inspection of cold end PA, SA in different passes	Unit 1 and 2	✓	
	– Check for any leakage	Unit 1 and 2	✓	
	– Cleaning of PA, SA tube banks from flue gas side	Unit 1 and 2	✓	
	– Check metallic expansion joints in PA and SA header	Unit 1 and 2	✓	
	– Inspect steam coil of SCAPH	Unit 1 and 2	✓	
	– Check tubes of SCAPH	Unit 1 and 2	✓	

Plan 14: Valves

The key activities to be executed by the Successful Bidder for repair / overhaul of the Valves shall include, but not be limited to, the following. The indicative list of spares to be procured for the Valves have been detailed in Annexure 2, Plan 14.

Component	Activity	Unit	Cat 1	Cat 2
Economizer and ring header drain valve	– Supply and install globe valve	Unit 1 and 2	✓	

Component	Activity	Unit	Cat 1	Cat 2
Start-up vent MOV	– Supply and install gate valve	Unit 1 and 2	✓	
Start-up vent control valve	– Inspect and repair/recondition control valve to ensure proper functioning	Unit 1 and 2	✓	
MS drain manual valve	– Inspect and repair/recondition globe valve	Unit 1 and 2	✓	
SH drain MOV	– Supply and install wedge gate valve	Unit 1 and 2	✓	
ERV	– Inspect and repair/recondition globe valve	Unit 1 and 2	✓	
SWAS	– Inspect and repair/recondition gate valve	Unit 1 and 2	✓	
Boiler fill drain line	– Inspect and repair/recondition all high energy valves including globe valves, gate valves, ring header drain valve, interconnecting valve (economizer and ring header), superheater drain valves, soot blower valve	Unit 1 and 2	✓	
Main steam safety valve (MSSV)	– Inspect and repair/recondition wedge gate valves	Unit 1 and 2	✓	
IBD Mov	– Supply and install global valve	Unit 1 and 2	✓	
L-Valve	– Inspect and repair/recondition L-valves	Unit 1 and 2	✓	
Safety valves	– Put match mark at the time of dismantling the valve	Unit 1 and 2	✓	
	– Dismantling, cleaning, and servicing of valves	Unit 1 and 2	✓	
	– Lapping of seat/disc, machining if required. Check spindle trueness	Unit 1 and 2	✓	
	– Servicing of blow down ring	Unit 1 and 2	✓	
	– Servicing of electrical assembly of electromatic valve	Unit 1 and 2	✓	
	– Assembly of the safety valve and floating as per specifications	Unit 1 and 2	✓	
General activities *(across all valves)*	– Dismantle the valve, inspection and servicing of all the parts.	Unit 1 and 2	✓	
	– Lapping of disc/seat, machining if required	Unit 1 and 2	✓	
	– Check spindle for wear/trueness. Replace if required	Unit 1 and 2	✓	
	– Change gland packing	Unit 1	✓	

Component	Activity	Unit	Cat 1	Cat 2
		and 2		
	– Change body/bonnet gasket and sealing ring	Unit 1 and 2	✓	

Plan 15: Electrical

The key activities to be executed by the Successful Bidder for repair / overhaul electrical parts shall include, but not be limited to, the following. The indicative list of spares to be procured for electrical parts have been detailed in Annexure 2, Plan 15

Component	Activity	Unit	Cat 1	Cat 2
Heat tracing CKT cable	– Supply and install FOPH tracing circuit	Unit 1 and 2	✓	
FA fan	– Supply and install motor for FA fan cooling fan	Unit 1 and 2	✓	
Lignite feeding System	– Supply and install lignite rotary feeder motor	Unit 1 and 2	✓	
	– Supply and install lignite bunker gate actuators	Unit 1 and 2	✓	
Soot blower	– Supply and install motors	Unit 1 and 2	✓	
Start up Inching MOV	– Supply and install MOV actuator	Unit 1	✓	
FOPH	– Supply and install axial exhaust fans as per specifications provided in Annexure 2, Plan 15	Common	✓	

Plan 16: C&I

The key activities to be executed by the Successful Bidder for repair / overhaul of C&I parts shall include, but not be limited to, the following. The indicative list of spares to be procured for C&I have been detailed in Annexure 2, Plan 16

Component	Activity	Unit	Cat 1	Cat 2
Gravimetric feeder	– Supply and install load cell	Unit 2	✓	
	– Supply and install speed sensor	Unit 1 and 2	✓	
Ash cooler phe	– Supply and install PHE temp control valve positioner	Unit 1 and 2	✓	
Lignite draglink	– Supply and install lignite draglink conveyor speed sensor	Unit 1	✓	
TAPH	– Supply and install TAPH thermocouple	Unit 1	✓	

Component	Activity	Unit	Cat 1	Cat 2
Control valve	– Supply and install reheater and superheater valve, SH and RH attemperator positioner, and gland sealing and BFP RC control valve	Unit 1 and 2	✓	
PRDS station	– Supply and install PRDS and BFP discharge pressure transmitter	Unit 1 and 2	✓	
FRS station	– Supply and install FRS DP transmitter	Unit 2	✓	
Feed water and steam flow	– Supply and install feed water and steam flow transmitter	Unit 2	✓	
IGV	– Supply and install seal kit and IGV cylinder for PA, SA, and ID fan	Unit 1 and 2	✓	
Ash Cooler valve	– Supply and install cylinder and seal kit	Unit 1 and 2	✓	
ID fan	– Supply and install ID fan scoop positioner	Unit 1 and 2	✓	
Bed Material Feeding System Valve	– Supply and install passing seal kit	Unit 1 and 2	✓	
Furnace	– Supply and install pressure transmitter	Unit 1 and 2	✓	
Drum and Main steam Pressure	– Supply and install pressure transmitter	Unit 1 and 2	✓	
Burner system	– Supply and install ignitor, ignitor tips, ignitor SOV, cylinder, and cylinder seal kit – Supply and install oil gun cylinder and oil gun cylinder seal kit – Supply and install oil gun SOV, oil valve SOV and steam valve SOV – Supply and install HFO flame scanner	Unit 1 and 2	✓	
	– Supply and install gas flame scanner	Unit 2	✓	
Damper spare	– Supply and install damper positioner for ash cooler flow control and burner flow control	Unit 1 and 2	✓	
	– Supply and install air flow control damper	Unit 2	✓	
HFO and LDO system	– Supply and install HFO and LDO tank	Common	✓	
Lime Handling System	– Supply and install switches, temperature gauges, belt sway and pull card rope, seal kit, SOV, actuator, and level transmitter as detailed in Annexure 2, Plan 16	Unit 1 and 2	✓	

Component	Activity	Unit	Cat 1	Cat 2
	– Supply and install pressure gauge, pressure switch and pressure transmitters across various locations as detailed in Annexure 2, Plan 16	Unit 1 and 2	✓	
	– Supply and install temperature gauge for various locations as detailed in Annexure 2, Plan 16	Unit 1	✓	
	– Supply and install RTD for lime mill	Unit 1	✓	
	– Supply and install seal kit, SOV, actuator, level transmitter, tacho sensor assembly, electronics speed controller, load unload SOV, booster relay, flow switch, and radar type level transmitter, as detailed in Annexure 2, Plan 16	Unit 1 and 2	✓	
HAG system	– Supply and install air filter regulator	Unit 1	✓	
	– Supply and install positioner for hag jack shaft actuator, copper tube, air filter regulator, ignitor set and flame scanner as detailed in Annexure 2, Plan 16	Unit 2	✓	
Screw pump	– Supply and install speed sensor and controller	Unit 1	✓	
	– Supply and install electronic speed switch	Unit 2	✓	
Bag filter purging system	– Supply and install solenoid valve and pressure gauge	Unit 2	✓	
Chain conveyor speed	– Supply and install speed switch	Unit 2	✓	
Bag filter control damper	– Supply and install air filter regulator	Unit 2	✓	
RC fan control damper	– Supply and install I/P convertor	Unit 2	✓	
Ash Cooler	– Supply and install pressure transmitters, vibration probe and RTD	Unit 1 and 2	✓	
Fans	– Supply and install vibration probe	Unit 1 and 2	✓	
BFP pumps	– Supply and install vibration probe	Unit 1 and 2	✓	

Component	Activity	Unit	Cat 1	Cat 2
Hot Water pumps	– Supply and install vibration probe	Unit 1 and 2	✓	
Flue gas analyzer	– Supply and install SO2, NOX, CO analyser and panel – Supply and install Zirconia Oxygen analyzer	Common	✓	
TAPH	– Supply and install TAPH O2 outlet analyzer	Unit 1 and 2	✓	

3.1.2.4. Radiography, leak testing, and arresting

The Successful Bidder shall conduct necessary non-destructive testing (NDT, e.g., dye penetrant test) to identify potential leakages in the boiler prior to arranging for hydro testing.

The Successful Bidder shall be responsible for arresting any leaks identified in the welding joints during hydro testing of the boilers and during the NDT. The Successful Bidder shall conduct radiography.

100% radiography and rectification of the failed and / or defective joints shall be in the scope of the Successful Bidder, at no additional cost. Qualified personnel with RT Level 2 certificates from IBR approved agencies shall be engaged by the Successful Bidder to conduct the radiography, as per appropriate safety guidelines and regulations.

3.1.3. Upgradation activities for ESP

3.1.3.1. Upgradation Plan

The key activities to be executed by the Successful Bidder for retrofitting and upgradation of the ESPs shall include the following. The list of spares to be procured for the ESP have been detailed in Annexure 3

1. **<u>Design and engineering</u>**

   i. TR panel modified circuit drawing for EPIC-III controller
   ii. ESP control system interface network diagram
   iii. Cable specification for SIR / alternative high frequency rectifier (HFTR)
   iv. SIR / alternative high frequency rectifier (HFTR) installation diagrams with bus duct modification etc.
   v. Gas Distribution (GD) test procedure
   vi. Commissioning protocols
   vii. Performance Guarantee (PG) test procedure
   viii. O&M manual for SIR / alternative high frequency rectifier (HFTR) and EPIC-III controller

2. **<u>Cleaning, painting, and protective coatings</u>**

i. Cleaning of all surfaces using wire brush
ii. Painting of all MS fabricated parts with 02 (two) coatings of rust protective Zinc Phosphate primer
    - Collecting electrodes – will be applied with rust preventive oil Bonita Chemicals
    - Emitting electrodes spiral – no painting as SS/904L
    - Bought out finished components – as per manufacturers' standard
iii. All MS fabricated parts being supplied shall be painted as specified above and exposed surface shall be finish painted as applicable
iv. All Emitting/ Collecting Rapping motor/structure with cover shall be painted as per below paint specification
v. All Existing TR sets body shall be painted as per below paint specification
vi. All Existing handrail at hopper floor and ESP top roof floor shall be painted as per below paint specification
vii. All Staircase handrail at ESP floor shall be painted as per below paint specification

The following painting shall be done at the site:

Surface cleaning	Manual means
Primer / mid coat	Two component polyamine epoxy mastic coating, Grey, 100 DFT
Finish coat	Two components chemically curing aliphatic acrylic polyurethane coating, 60 DFT

3. <u>Electrical requirements</u>

i. Design equipment as per ambient temperature of 50 degree C and relative humidity of 95%
ii. Ensure all equipment is designed and suitable for
    - Electric power shall be as per 415 V +/- 10% ,50 Hz +/- 5% ,AC 3 Phase,4 Wire
    - DC Supply shall be of 24 volts
    - For instrumentation power supply shall be 110 V +/- 10% AC, 50 Hz +/- 1%, AC Single Phase

4. <u>Switched Interface Rectifier (SIR) and Control for 4 fields</u>

i. Supply and installation of 4 nos. SIR / alternative high frequency rectifier (HFTR) for 1st and 2nd fields (existing 1 ph TR shall be retained for remaining fields
    - SIR is a High Voltage Power Supply for ESP, based on high frequency power conversion. SIR combines a transformer/high voltage rectifier (TR) and control system for energizing and controlling ESP fields in one integrated unit. SIR Controller is the advanced controller inbuilt in SIR, with an integrated rapping control & pulse optimization software. The controller

optimizes the field charging with regard to process conditions resulting in lowest possible particulate emission for ESP

ii. Modify bus duct for installing SIRs on ESP roof to the respective field connection

5. MCC and ACP

i. Repair ACP (Auxiliary Control Panel) feeders for 3 phase power supply to SIR at ESP roof top – existing feeders are 3-phase compatible with 400 Amp rating and shall be retained
ii. Install and commissioning of feeder for hot air purging system in Unit 1 – spare feeder available at the Plant and ready to be used
iii. Supply spare feeder for hot air purging system in Unit 2
iv. Provide required electrical load data - Required power of 415V, 3 ph, 50 Hz, AC at input as per load list shall be provided by the Owner

6. ESP Control System and TR Controller

i. Supply and install advanced EPIC – III controller in 3rd and 7th fields, replacing the EPIC – II controller in existing panels
ii. Establish common control network between SIR controllers and EPIC – III controllers for all fields of boiler unit ESPs over Ethernet protocol vis Ethernet switch and Ethernet Terminal Unit (ETU) which shall be installed in the Local Panel Control Room for online monitoring and control from a single point
iii. Controllers shall have inbuilt feature for rapping sequence control

7. Rapping geared motors

i. Supply spare geared motors as defined in Annexure 3
ii. Service / repair existing geared motors to ensure compliance with the following specifications
    - Motor rating – 0.37 kW
    - Enclosure – TEFC
    - Protection class – IP 55
    - Efficiency – IE2 / EFF2
    - Insulation class – F / temp rise limited to Class B

8. Hot air purging system, local heaters, shaft insulators, and hoppers

i. Supply and install hot air purging system for insulators at ESP roof with heater bank and blower for support and shaft insulators to keep the insulators clean and extend life
ii. Modify existing MCC as per requirements

9. Power and control cable

i. Supply and install the following cables for each SIR
    - 3.5Cx120 Sq. mm. Al., XLPE insulated cable from ESP control room Power feeder to ESP roof
    - 25 Sq. mm. Cu. Flat / cable for earthing (approx. 20 mts)
    - 35 Sq. mm. Cu. Flat / cable for return path (approx. 20 mts)

- 4cx1.5 sq mm Cu. Armored control cable for rapping motor interface with SIR

3.1.3.2. Commissioning activities

The Successful Bidder shall be responsible for commissioning of the Boiler and ESP across both units of the Plant and ensuring observation for 72 hours after operationalization at full load with design parameters and continuous operation of machine, with observation of performance parameters and supervisory parameters.

3.2. Scope for supply of material

The Successful Bidder shall procure all material / equipment / spares as per the quantities and specifications detailed in Annexure 2 (Boiler) and Annexure 3 (ESP) for overhauling of both units of the Plant simultaneously.

The material / equipment / spares detailed in Annexure 2 (Boiler) have been classified into two categories, as per the following definitions:

Category 1: Material / equipment / spares required across key components to be undertaken as part of the Overhaul. Any additional material (i.e., not detailed as part of the BoQ in Annexure 2) for components classified as Category A identified during inspections, shall be notified to competent authority from the PMC and the Owner, and shall go through the 'Rate Settlement Mechanism', as detailed in Section 6 of Part 2 of this document.

Category 2: Multiple types of tubes and refractory required across the boilers as per tentative quantities defined in Annexure 2. Additional quantities of tubes or refractory over and above the quantities defined in the BoQ in Annexure 2 shall be notified to the competent authority from the PMC and the Owner and shall go through the 'Quantity Variance Mechanism' defined in Section 5.1 of Part 2 of this document.

3.2.1. Procurement planning

1. The Successful Bidder shall create a 'Procurement Register' for the Boiler and ESP Package in collaboration with the PMC, including all the detailed item-wise Bills of Quantity (BoQs) with associated costs and technical specifications to ensure adherence to desired quality and exercise cost control within Contractual limits
2. The Successful Bidder shall prepare a 'Procurement Plan' for the Boiler and ESP Package for the purpose of monitoring all Procurement activities and ensuring timely delivery of all material across all Packages, in line with the timelines mentioned in Section 2.2 (Contract Duration) and Section 11.2 (Payment Milestones)
3. The Successful Bidder shall coordinate with the PMC in maintaining a digital data sheet (in excel format) of the 'Procurement Plan', with the desired timelines and costs vis-à-vis the actual timelines followed and costs incurred to track compliance. The Successful Bidder and PMC shall grant all requisite access to the data sheet to the Owner, and share necessary summaries for reporting purpose, if requested

3.2.2. Physical verification

The Successful Bidder shall, in coordination with the PMC, conduct physical verification of existing inventory at the Plant to identify the equipment and associated spares and material readily available to be utilized during the Overhaul. Further, the Successful Bidder shall integrate the existing inventory with the 'Procurement Register' to ensure optimal Procurement and consumption of material.

3.2.3. Material management

The Successful Bidder shall deploy sufficient manpower and appropriate material management systems (e.g., ERP solutions) or use the Owner's material management system to track movement of material and adherence to schedules and quality. The modalities for material management shall be mutually agreed between the Successful Bidder and the Owner, in consultation with the PMC, prior to initiation of procurement of material. Further, the Successful Bidder shall integrate the system with the digital data sheet described in Section 3.2.1 of Part 2 of this document.

3.2.4. Quality management

The Successful Bidder shall ensure the procurement of material is as per the technical and design specifications provided in Annexure 2 (Boiler) and Annexure 3 (ESP), and adhere to highest standard of engineering and workmanship, to ensure after completion of the Overhaul, the Plant shall be capable of performing in a safe, reliable, sustainable, and in a manner acceptable to the owner.

3.2.5. Packing and transportation

1. The Successful Bidder shall be responsible for packing and transportation of all material to be repaired / refurbished from the Plant to the Successful Bidder's / supplier's facilities and back to the Plant. The Successful Bidder shall also be responsible for loading, unloading, preservation, and storage of the material during transit
2. The Successful Bidder shall arrange for appropriate transit insurance and clearances from relevant authorities for all material to be transported from the Plant to the Successful Bidder's / supplier's facilities and back
3. The Successful Bidder shall be solely responsible to replace the material that may be damaged or lost in transit and shall bear the cost for all such material. Further, the Successful Bidder shall provide notice in writing to the owner, copying the PMC and the Owner with the details of the issue, as needed

3.2.6. Factory (FATs) and site acceptance tests (SATs)

1. The Successful Bidder shall arrange for factory acceptance tests to be conducted for all the material / equipment at the Successful Bidder's/ supplier's facilities, prior to shipping, in the presence of the owner, the PMC, and other representatives deployed by the owner, if needed

2. The Successful Bidder shall arrange for appropriate certificate through Government approved NABL labs for material of construction (MOC) used for the material/equipment procured
3. The Successful Bidder shall provide a notice of at least 3 weeks prior to arranging for factory acceptance tests at the Successful Bidder's/ supplier's facilities and provide the procedure for conducting the test for the owner's approval
4. The factory acceptance tests shall include, but shall not be limited to, the following key activities:
    i. Visual inspection: Inspection of the material / equipment for any physical defects, damage, or other issues
    ii. Functional testing: Testing the material / equipment to ensure that it performs the intended functions and meets the specified performance criteria, as applicable
    iii. Safety testing: Testing the safety features of the material / equipment to ensure that they function as intended and meet any applicable safety standards or regulations, as applicable
    iv. Documentation review: Reviewing the documentation related to the material / equipment, such as user manuals, technical specifications, and test reports
5. The Successful Bidder shall ship the material / equipment to the Plant only upon successful completion of the factory acceptance tests and sign-off by the owner and owner's representatives
6. Upon delivery and installation of material / equipment at the Plant, the Successful Bidder shall arrange for a site acceptance test in the presence of the owner, the PMC, and other representatives deployed by the owner, if needed, to ensure safe delivery of all material / equipment at the Plant
7. The Successful Bidder shall provide a notice of at least 3 weeks prior to arranging for site acceptance tests at the Plant and provide the procedure for conducting the test for the owner's approval
8. The site acceptance tests shall include, but shall not be limited to, the following key activities, as may be applicable:
    i. Verification of installation: Verifying that the equipment or system has been installed correctly, according to the manufacturer's instructions and any applicable standards or regulations
    ii. Functional testing: Testing the material / equipment to ensure that it performs the intended functions and meets the specified performance criteria
    iii. Integration testing: Testing the integration of the material / equipment with other systems or components that it will be working with, prior to commissioning
    iv. Operational testing: Testing the material / equipment under various operating conditions to ensure that it can perform reliably and consistently

v. Documentation review: Reviewing the documentation related to the material / equipment, such as user manuals, technical specifications, and test reports

3.2.7. Storage of material in Plant

The Successful Bidder shall be responsible for storage of all procured material / equipment at the Plant within the Successful Bidder's shed. The Successful Bidder shall be solely responsible for security of the material / equipment at the Plant. In case of theft / burglary / loss of material, the Successful Bidder shall bear the cost of replenishing the material and ensure timely delivery to minimize impact on the execution of the Overhaul.

3.3. Standards for performance of obligations

The Successful Bidder represents and warrants that it has the requisite skills, experience, expertise, and capacity to fulfill its obligations and responsibilities under the Contract. The Successful Bidder shall perform all of its services hereunder in accordance and compliance with:

1. Accepted prudent industry practices
2. Incident reporting with corrective and preventive measures
3. Implementation of lessons learnt from incidents on similar facilities
4. All Applicable Laws
5. All applicable clearances to be obtained and maintained including but not limited to all relevant health and safety legislations, environment permits and licenses

The Successful Bidder shall have round-the-clock qualified, trained, and experienced, with valid necessary certifications, crew of adequate strength who are alert and vigilant for carrying out all the normal and emergency operations, start-up, and shutdown of Boilers and the ESPs across both units. Startup and shutdown of the plant will be done by ATPS engineers under supervision of the Successful Bidder.

3.4. Standards for Sub-contracting

For the purpose of performing its obligations under the Contract, the Successful Bidder may appoint Sub-Contractors with prior written intimation to the Owner as deemed fit. Appointment of such Sub-Contractors by the Successful Bidder shall at no time mean that the Successful Bidder is relieved of its primary duty and liability to perform its obligations as set out in the Contract. The Contractor shall be responsible for:

1. Obtaining any and all necessary authorizations required for use of all Plant infrastructure / facilities in connection with the performance of its obligations hereunder
2. Ensuring adherence to standard operating procedures and safety standards by the Sub-Contractor and be liable in the event of any issue affecting the performance of the asset

4. Responsibilities and rights of the Owner

4.1. Responsibilities of the Owner

The Owner shall be responsible for the following key activities pertaining to the execution of the Overhaul of the Plant

4.1.1. Access to Plant infrastructure

The Owner will arrange for the Successful Bidder's accommodation and food and beverage requirements at the Plant for the key Personnel deployed on ground to oversee the execution of the Overhaul, on chargeable basis and on the basis of availability of accommodation. In case infrastructure is not available, the Successful Bidder shall be responsible for arranging the same. The Successful Bidder shall ensure that the Personnel are available at the Plant for the entire course of Overhaul and shall take requite consent from the Owner with prior intimation through a Written Notice in case of any changes in availability of Personnel.

4.1.2. Access to documents and data

The Owner shall provide the Successful Bidder with access to available drawings, documents, design manuals, and operational information required for the successful execution of the Overhaul. In case any technical drawing, document is unavailable with the owner, then the same shall be developed by the Successful Bidder at its own cost.

4.1.3. Shutdown and startup activities

The shutdown (prior to commencement of the Overhaul), and startup of the plant (post successful completion of the performance guarantee tests) shall be done by the Owner, in the presence and supervision of the Successful Bidder.

4.2. Rights of the Owner

The Owner, throughout the tenure of the Contract, reserves the following rights relating to preparation and execution of the Overhaul of the Plant, not specifically granted to the Successful Bidder.

4.2.1. General policies and procedures

The Owner reserves the rights for review and determination of general policies and procedures not previously delegated to the Successful Bidder as part of the scope of work.

4.2.2. Audits

The Owner may, from time to time, designate any responsible person on its behalf to conduct audits, pertaining to the Owner's capacity defined in the Contract, of financial (billing and invoicing), technical, safety, and to visit and inspect the Plant to discuss such affairs, which relate to the services provided by the Successful Bidder, with its authorized representatives.

4.2.3. Access to data

The Owner reserves the rights to access all records, documents, and data relating to the services provided by the Successful Bidder during the preparation and the execution of the Overhaul, including for making copies thereof or extracts.

The Owner shall have the right, at all times, on reasonable notice and at the premises of the Successful Bidder to examine drawings / design documents which have been prepared by the Successful Bidder

5. Quantity Variance Mechanism

5.1 For supply of material

1. The quoted rates for all material / equipment / spares detailed in the BoQ in Annexure 2 shall remain the same irrespective of any variation in individual quantities
2. The quantities given in the BoQ in Annexure 2 for Category 1 shall remain fixed and will not be subjected to quantity variance
3. The quantities given in the BoQ in Annexure 2 for Category 2 are tentative and may change to any extent (both on plus and minus side)
4. Quantity variance shall be applicable on Category 2 items up to a limit of 15% (fifteen percent) of the lumpsum price for supply of material and lumpsum price of execution of Overhaul for Category B items / activities (both on plus and minus side)

5.2 For services

1. The lumpsum price for execution of Overhaul for Category 2 activities as per Section 3.1.2 of Part 2 of this document shall vary proportionately with any change in quantity for Category 2 items (both on plus and minus side)
2. Quantity variance shall be applicable on Category 2 items up to a limit of 15% (fifteen percent) of the lumpsum price for supply of material and lumpsum price of execution of Overhaul for Category 2 items / activities (both on plus and minus side)

6. Rate Settlement Mechanism

During the execution of the Overhaul, if the Successful Bidder identifies additional items to be procured and associated services to be performed, over and above the Category 1 items given in the BoQ in Annexure 2 (for Boiler), to restore the health of the equipment and ensure performance, such items and services shall be notified to the competent authorities of the PMC and the Owner prior to initiation of procurement or execution of the services.

A ’Rate Settlement Committee’ shall be established with competent authorities from the PMC and the Owner. The Boiler Package Leader shall present the need for the additional items and / or services to the ‘Rate Settlement Committee’, with a rationale for the quantities of items to be procured and rates for the items and / or services discovered in the market. The committee shall reserve the right to negotiate the rates and authorize the Successful Bidder to initiate procurement of the identified items and / or execution of the services.

7. Performance Guarantee Testing (PGT) and acceptance procedures

7.1. Performance Guarantee Testing (PGT)

1. The Successful Bidder shall submit for PMC and Owner's approval, the detailed Performance Test procedure containing the following:
    i. Object of the test
    ii. Various guaranteed parameters and tests as per contract
    iii. Method of conductance of test and test code
    iv. Duration of test, frequency of readings and number of test runs
    v. Method of calculation
    vi. Correction curves
    vii. Instrument list consisting of range, accuracy, least count, and location of instruments
    viii. Scheme showing measurement points
    ix. Sample calculation
    x. Acceptance criteria
    xi. Any other information required for conducting the test
2. The Performance /Acceptance tests shall be carried out by the Successful Bidder as per the procedures approved by competent authority of the PMC and the Owner in accordance with the procedures as per the ASME PTC 4.1 (for Boiler) and as per IS-11255, Part 1 and 3, 1985, reaffirmed 2003/2008 (for ESP)
3. The Successful Bidder shall make the equipment ready for carrying out the performance guarantee tests post completion of the Overhaul
4. The tests shall be binding on the Successful Bidder to determine compliance of the equipment with the desired outcomes. No separate performance tests need be done on equipment which is already tested at shop
5. All instruments required for performance testing shall be of the type and accuracy required by the code and prior to the test, the Successful Bidder shall get these instruments calibrated in an independent test institute. All test instrumentation required for performance tests shall be supplied by the Successful Bidder and shall be retained by him upon satisfactory completion of all such tests at site. All costs associated with the supply, calibration, installation, and removal of the test instrumentation shall be borne by the Successful Bidder. All calibration procedures and standards shall be subjected to the approval of the owner. The protecting tubes, pressure connections and other test connections required for conducting guarantee test shall conform to the relevant codes
6. Tools and tackles, thermo wells (both screwed and welded) instruments/ devices including flow devices, matching flanges, impulse piping, and valves etc., and any special equipment, required for the successful completion of the tests, shall be provided by the Successful Bidder.
7. After the conductance of Performance test, the Successful Bidder shall submit the test evaluation report of Performance test results to owner promptly but not later than two weeks from the date of conductance of Performance test. However, preliminary test reports shall be submitted to the owner after completing each test run

7.2. Desired outcome parameters

The Successful Bidder shall adhere to the desired outcome parameters defined below in order to ensure successful completion of the Overhaul and obtain an 'Operation Acceptance Certificate' by the PMC.

S. No	Parameter	Desired outcome (for each Unit)	Tolerance
Boiler			
1	Boiler Efficiency *(Estimated as per ASME PTC 4.1 method)*	83.0%	–
2	SH steam flow at the outlet	405 TPH at 100% BMCR	+-5 TPH
3	Main steam flow at HP turbine inlet	367.18 t/h at 100% load	
4	SH steam temperature at the outlet	538 °C at 100% BMCR	+- 5 °C
5	RH steam temperature at outlet	537 °C at 100% BMCR	+- 5 °C
6	RH spray flow	0.5% at 100% TMCR	+- 0.2%
7	Hot Reheat Steam Flow at IP turbine inlet	340.45 t/h at 100% load	+-3 TPH
8	Pressure drop from Eco inlet to SH outlet	14.5 bar at 100% BMCR	+- 2 bar
9	Pressure drop from RH inlet to RH outlet	1.90 bar at 100% BMCR	+- 0.1 bar
10	Flue gas temperature leaving TAPH	135° C at 100% TMCR	+- 5 °C
11	Flue gas pressure loss between cyclone outlet and TAPH outlet	18 mbar at 100% BMCR	+- 5 bar
12	Limestone consumption	< 55 t/h	–
13	Minimum load without oil firing	50% BMCR	–
ESP			
1	Particulate matter (with limestone feeding in operation)	30 mg/Nm3	
2	SO_2 (with limestone feeding in operation, as per lignite and lime characteristics defined below)	600 mg/Nm3	
3	NO_x (with limestone feeding in operation, as per lignite and lime characteristics defined below)	300 mg/Nm3	
4	Mercury (with limestone feeding in operation, as per lignite and lime characteristics defined below)	0.03 mg/Nm3	
5	ESP efficiency	99.985%	- 0.01%

S. No	Parameter	Desired outcome (for each Unit)	Tolerance
	(At design inlet dust load of 205 gm/Nm3 and emission of 30 mg/Nm3, (wet basis, actual O2%))		
6	Auxiliary Power Consumption *(Including SIR and TR corona power, hopper heater power, rapping motor power, insulator purge system power)*	525 KW	+ 2%
7	Pressure drop across ESP	20 mmWC	+ 2%
8	Air leakage across ESP	2.6 m3/sec (1% of design inlet gas flow)	+ 5%

Lignite Characteristics

The Successful Bidder shall conduct proximate analysis, ultimate analysis, and particle size distribution tests for the lignite fired during the Performance Guarantee Test and submit the reports to the competent authority from the PMC and the Owner as part of the test.

The lignite characteristics used for estimation of the guaranteed values have been specified below:

Proximate Analysis

Parameter	Unit	Value	Range for Performance Testing
Moisture	%	35	30 – 35
Ash	%	21	18 – 35
Volatile	%	26	20 – 30
Fixed C	%	18	12 – 20
Sulphur	%	3.87	2 – 4.55
HHV	Kcal/kg	3,205	2000 – 3205

Ultimate Analysis

Parameter	Unit	Value
Carbon	%	30.52
Hydrogen	%	2.16
Nitrogen	%	0.51
Oxygen	%	6.94
Moisture	%	35.0
Ash	%	21.0

Particle Size Distribution of Lignite

Parameter	Value
> 6mm (max. 10 mm)	1%
0 – 6 mm	99% (min)
0 – 3.5 mm	85 – 90%
0 – 2 mm	50 – 60%
0 – 1 mm	20 – 30%
0 – 0.5 mm	10 – 20%

Limestone Characteristics

The Successful Bidder shall conduct analysis of the limestone consumed during the Performance Guarantee Test and submit the reports to the competent authority from the PMC and the Owner as part of the test.

The limestone characteristics used for estimation of the guaranteed values have been specified below:

Parameter	Unit	Value
CaO	%	45.12
Fe2O3	%	5.03
Al2O3	%	2.78
P2O5	%	0.03
MnO	%	0.54
MgO	%	1.44
CaCO3	%	80.60
MgCO3	%	3.00
Moisture	%	2 – 3

Particle Size Distribution of Lignite

Parameter	Value
> 0.6 mm	5% (max)
0 – 0.4 mm	95% (min.)
0 – 0.315 mm	70 – 80%
0 – 0.2 mm	55 – 65%
< 0.090 mm	40 – 50%

Design parameters for upgraded ESP

The parameters for upgraded ESP used for estimation of the guaranteed values have been specified below:

S. No	Parameter	Unit	Value for each 125 MW boiler ESP	Acceptable limits
1	Gas volume [total for two ESPs in one boiler unit]	m3/s, wet, actual O2	260	+-10 m3/s
2	Flue Gas temperature at inlet	Deg C	136	+- 2 deg C
3	Moisture content in flue gas	% by volume	10	+- 2%
4	Static pressure at ESP inlet	mmWC	- 265	+- 5 mmWC
5	Inlet dust load (with Lime Feeding)	gm/Nm3, wet, actual O2	205	+ 5 gm/Nm3
6	Outlet Emission after the proposed upgrade	mg/Nm3, wet, actual O2	<=30	

7.3. Notice of tests

The Successful Bidder shall issue 21 (twenty-one) days' notice to the Owner of the date after which he will be ready to commence the tests and the Successful Bidder shall commence the tests promptly thereafter.

7.4. Retesting

If the unit fails to pass the test (which in the case of performance tests means not achieving the acceptable limits), the Owner reserves the right to ask the Successful Bidder to repeat such tests on the same terms and conditions. The retest shall be conducted by the Successful Bidder within 14 (fourteen) days of notification from the Owner.

7.5. Delayed tests

If the tests could be carried out but are being unduly delayed by the Successful Bidder, the Owner may by notice inform the Successful Bidder to conduct the tests within 14 (fourteen) days after the receipt of such notice. The Successful Bidder shall conduct the tests on such days within that period as the Successful Bidder may fix and of which he shall issue notice to the Owner.

If the Successful Bidder fails to conduct the tests within such notice the Owner may himself proceed with the tests. All tests so conducted by the Owner shall be at the risk and cost of the Successful Bidder and the cost thereof shall be deducted from the contract price or charged to the Successful Bidder. The tests shall then be deemed to have been conducted by the Successful Bidder and the test results shall be binding on the Successful Bidder.

7.6. Independent inspector

The Owner reserves his right to appoint an independent inspector, at its own cost, as its representative to discuss the test program, to approve the instrumentation, to witness the tests and to analyze the test results.

It is Successful Bidder's responsibility to co-ordinate for suitably carrying out the performance tests. The duration of the test shall be in accordance with the agreed test codes at the loads after necessary stabilizing period to obtain steady state conditions. All other tests to prove the guarantees as indicated in the Successful Bidder's offer shall also be conducted.

The equipment parameters during the performance test shall be adjusted as far as practicable to the guaranteed performance test conditions. The tests shall be conducted to prove guaranteed parameters as defined in the contract.

The performance test results shall be reported as computed from the performance test observations with corrections for site conditions, variations in load, etc., and test conditions. Such correction curves shall be submitted along with the bid. No additional allowances for errors in measurement are permissible. The measurement uncertainty on the performance test guarantee values, as reported on the basis of above tests shall not exceed the uncertainty limits specified.

7.7. Reporting of test results

Immediately after the conclusion of the performance test, The Successful Bidder shall submit a test report (Six copies of each test) to the Owner stating whether the unit has passed or failed such test, accompanied by sufficient test data and calculations to demonstrate the level of performance attained with respect to each of the tested parameters.

The report(s) shall include as a minimum, the following:

i. Description of the test procedures
ii. Standards that were used
iii. Instrumentation details and calibration
iv. Full schematic diagrams with indication of instrument test location and identification tag of same
v. Test logs and summary of test readings used for efficiency calculations
vi. Full set of correction curves, if applicable
vii. Computation of test results
viii. Computations to prove measurement uncertainty is within acceptable limits
ix. Boiler Efficiency
x. Plant performance parameters
xi. Templates for calculations (validated by the PMC)
xii. Data reduction
xiii. Chronology of events
xiv. List of exceptions to procedure
xv. Operator log sheets
xvi. Detailed calculations at guaranteed loads
xvii. Conclusions of performance tests: test passed or not

7.8. Acceptance of test report

Within 14 (fourteen) days of receipt such test report(s), the Owner shall submit a notice to the Successful Bidder stating either:

i. That Owner concurs with the information provided in the Successful Bidder's test report(s), or
ii. That Owner disputes some or all of the information provided in the Successful Bidder's test report(s), the areas being disputed, and the levels of performance being disputed.

If Owner concurs with the information in the Successful Bidder's test report(s), the Owner shall, within 14 (fourteen) days of receipt of the test report, provide a written notice to the Successful Bidder accepting the results of the tests.

If Owner disputes any or all of the results contained in the Successful Bidder's test report(s), representatives of the Successful Bidder, Owner and the Engineer shall meet within 14 (fourteen) days of the receipt of the Owner notice at a mutually acceptable location to review and discuss the dispute.

7.9. Disagreements as a result of tests

If the Owner and the Successful Bidder disagree on the interpretation of the test results, each shall give a statement of his views to other within reasonable time after such disagreement arises. The statement shall be accompanied by all relevant evidence. The Owner and the Successful Bidder shall mutually discuss and agree regarding the results of the test.

8. Reporting requirements and deliverables

The Successful Bidder shall prepare and submit a comprehensive 'Overhaul Completion Report' incorporating the key activities undertaken, results of the Performance Guarantee Test, and list of material supplied to the Owner as part of the Overhaul, within 2 weeks of completion of the Overhaul, to mark the completion of the Overhaul.

Further, the Successful Bidder shall prepare and submit fortnightly progress reports with the PMC, and the Owner. Each progress report shall include:

1. Photographs and detailed descriptions of progress including each stage of design, procurement, manufacture, delivery at Site, construction, erection, testing and commissioning
2. A detailed description of the milestones achieved, and the Work/ Services performed prior to the date of the fortnightly progress report and the extent to which payments therefore have been received against the milestones
3. A description of the current status (the name of manufacturer, manufacture location, percentage progress, and the actual or expected dates of commencement of manufacture, Successful Bidder's inspections, tests, and delivery) of supplies and Equipment and of Successful Bidder's and all Major Sub-Contractors activities and engineering, manufacturing and construction progress as compared with the Project Schedule.
4. Copies of quality assurance reports including test results (i) from the manufacturing and fabrication facilities of all Sub-Contractors and (ii) with respect to all construction activity at the Facility Site
5. Safety statistics required under Applicable Laws, including details of any hazardous incidents and activities relating to environmental aspects and public relations.

6. Comparisons of actual and planned progress, with details of any aspects which may jeopardize the completion in accordance with the Contract, including Overhaul Execution Plan and the mitigation measures / action plan being (or to be) adopted to overcome such aspects. It shall include a clear identification and evaluation of problems and deficiencies in the Services (including but not limited to an evaluation of any factors which are anticipated to have a material effect on the Project Schedule).
7. Any other information as considered necessary by Owner / Owner's Representative.

9. Contract performance measurement

9.1. Key Performance Indicators (KPIs)

The Successful Bidder shall adhere to the following KPIs and targets during the Overhaul. In case of shortfall, liquidated damages shall be applicable and in case of superior performance, incentives shall be applicable as per the following sections:

9.1.1. Time-based KPIs

Phase	KPI	Liquidated damages	Incentive
Execution of Overhaul	Schedule compliance with 'Overhaul Execution Plan' for Boiler and ESP package prepared by the Successful Bidder as per Section 3.1.1.1 of Part 2 of this document	0.5% of lumpsum price for Overhaul execution for every week of delay in completion of 'Overhaul Execution Plan'	0.5% of lumpsum price for supply of material and lumpsum price for Overhaul execution for every week of delivering ahead of schedule in completion of 'Overhaul Execution Plan'

Note–Any delay more than 3 days shall be accounted as a week of delay while calculating the liquidated damages

9.1.2. Performance-based KPIs

KPI	Threshold (for each Unit)	Liquidated damages
Boiler		
Limestone consumption rate	55 TPH	INR 18 Lakhs per 1 TPH increase in limestone consumption
ESP		
ESP efficiency *(At design inlet dust load of 205 gm/Nm3 and emission of 30 mg/Nm3, (wet basis, actual O2%))*	99.985%	INR 30 Lakhs for 0.01% shortfall in ESP efficiency
Auxiliary Power Consumption *(Including SIR and TR corona power, hopper heater*	525 KW	INR 1.85 Lakhs per KW increase in APC of ESP

KPI	Threshold (for each Unit)	Liquidated damages
power, rapping motor power, insulator purge system power)		
Pressure drop across ESP	20 mmWC	INR 6 Lakhs per mmWC increase in pressure drop
Air leakage across ESP	2.6 m3/sec (1% of design inlet gas flow)	INR 5.5 Lakhs per m3/sec increase in air in leakage

9.2. Overall ceiling on Liquidated Damages and incentives

1. All liabilities due from the Successful Bidder arising out of the shortfall of performance levels mentioned under Section 9.1, as per the liquidated damages defined in Section 9.1, during the course of the Overhaul, shall be restricted to a maximum of 10% of the lump sum price for supply of material and Overhaul execution defined in Section 11.1 of Part 2 of this document

2. All incentives due to the Successful Bidder arising out of the enhanced performance levels mentioned under Section 9.1, as per the incentives defined in Section 9.1, during the course of the Overhaul, shall be restricted to a maximum of 5% of the lump sum price for supply of material and Overhaul execution defined in Section 11.1 of Part 2 of this document

10. Defect liability

1. The Successful Bidder warrants that the Boiler and ESP or any part thereof shall be free from defects in the design, engineering, materials, and workmanship of the equipment supplied and of the work executed
2. The Defect Liability Period shall be 18 (eighteen) months from the date of Completion of the Overhaul (or any part thereof) or 12 (twelve) months from the date of Operational Acceptance of the equipment (or any part thereof), whichever first occurs, as certified by the PMC/owner /any agency on behalf of owner
3. If during the Defect Liability Period any defect should be found in the design, engineering, materials, and workmanship of the equipment supplied or of the work executed by the Successful Bidder, the Successful Bidder shall promptly, in consultation and agreement with the Owner regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good (as the Successful Bidder shall, at its discretion, determine) such defect as well as any damage to the equipment caused by such defect
4. The Owner shall give the Successful Bidder a notice stating the nature of any such defect together with all available evidence thereof, promptly following the discovery thereof. The Owner shall afford all reasonable opportunity for the Successful Bidder to inspect any such defect.
5. The Owner shall afford the Successful Bidder all necessary access to the Plant to enable the Successful Bidder to perform its obligations under this clause

6. The Successful Bidder may, with the consent of the Owner, remove from the Plant, any equipment or any part of the equipment that are defective if the nature of the defect, and/or any damage to the Plant caused by the defect, is such that repairs cannot be expeditiously carried out at the Plant
7. If the repair, replacement or making good is of such a character that it may affect the efficiency of the equipment or any part thereof, the Owner may give to the Successful Bidder a notice requiring that tests of the defective part of the equipment shall be made by the Successful Bidder immediately upon completion of such remedial work, whereupon the Successful Bidder shall carry out such tests.
8. If such part fails the tests, the Successful Bidder shall carry out further repair, replacement or making good (as the case may be) until that part of the equipment passes such tests. The tests in character shall in any case be not less than what has already been agreed by the Owner and the Successful Bidder for the equipment
9. If the Successful Bidder fails to commence the work necessary to remedy such defect or any damage to the equipment caused by such defect within a reasonable time (which shall in no event be considered to be less than fifteen (15) days), the Owner may, following written notice to the Successful Bidder, proceed to do such work, and the reasonable costs incurred by the Owner in connection therewith shall be deducted by the Owner from any payment due to the Successful Bidder or claimed under the Performance Security
10. If the equipment or any part thereof cannot be used by reason of such defect and/or making good of such defect, the Defect Liability Period shall be extended by a period equal to the period during which the equipment or such part cannot be used by the Owner because of any of the aforesaid reasons. Upon correction of the defects in the equipment or any part thereof by repair/ replacement, such repair/ replacement shall have the Defect Liability Period extended by a period of twelve (12) month from the time such replacement/repair of the equipment or any part thereof
11. If a defect in equipment or any part thereof supplied by the Successful Bidder occurs a total of once during the original Defect Liability Period, the extension of the original Defect Liability Period for the repaired or replaced part(s) or equipment shall not extend beyond a total of twenty-four (24) months from the beginning of the original Defect Liability Period
12. However, if there are recurring (more than once) failures in an equipment or any part thereof supplied by the Successful Bidder within twenty-four (24) months from the beginning of the original Defect Liability Period, the warranty shall be limited to a period of five (5) years from the end of the Defect Liability Period
13. At the end of the Defect Liability Period, the Successful Bidder liability ceases except for latent defects. The Successful Bidder's liability for latent defects warranty shall be limited to a period of five (5) years from the end of Defect Liability Period. For the purpose of this clause, the latent defects shall be the defects inherently lying within the material or arising out of design deficiency which do not manifest themselves during the Defect Liability Period
14. In case, there is any dispute between Owner and Successful Bidder regarding latent defects, a third party as mutually agreed upon by the Owner and the Successful Bidder shall be engaged by the Owner for settling the dispute

15. The third party, so engaged by the Owner, shall be paid fee plus reasonable expenditures incurred in the execution of its duties as mentioned above. These costs shall be recoverable from the Successful Bidder and the Successful Bidder shall bear and / or reimburse such costs to the Owner if the latent defect has been proved. If the dispute regarding latent defects cannot be settled as above, then the dispute shall be settled as per Section 14.6 (Arbitration) as deemed fit

11. Payment terms

11.1. Lumpsum Boiler and ESP Package Charges

The Successful Bidder shall quote the lumpsum charge for supply of material and lumpsum charge for Overhaul execution (services) for the duration of the execution of the Overhaul.

11.1.1. Lumpsum charges for supply of material

The Successful Bidder shall quote the unit rate for all items detailed in the BoQ given in Annexure 2 and Annexure 3. The lumpsum charges for supply of material shall be calculated as the sum of the unit rates times the quantities detailed in the BoQ for all items.

11.1.2. Lumpsum charges for Overhaul execution

The Successful Bidder shall quote the service charges for Category 1 and Category 2 activities separately as per the indicative format in Annexure 14. The lumpsum charges for execution of Overhaul shall be estimated as the sum of the charges quoted for Category 1 and Category 2.

11.2. Payment milestones

The Owner hereby covenants to pay the Successful Bidder for performance of the Contractual terms as payment terms specified hereunder –

T – date of acceptance of LOA

Category	Activity	% of total contract value	Timelines
Supply of material	Advance payment for procurement of spares, after submission of Performance Security and submission of item-wise price list	10%	T + 2 weeks
	Placement of POs for procurement of spares	25% (pro-rated[1])	T + 10 weeks
	Delivery of material on site with physical verification, certification,	40% (pro-rated[1])	T + 24 weeks

[1] Bidders to provide detailed item wise price for the required spares detailed in Annexure 2 (Boiler) and Annexure 3 (ESP) of this document within 14 days from date of acceptance of LoA. The payment on delivery of material on site shall be prorated as per the items delivered against the required spares, upon certification by the PMC.

Category	Activity	% of total contract value	Timelines
	and sign-off by the PMC		
	Completion of SATs for equipment across both units and issue of certificate by PMC	5%	T + 28 weeks
	Completion of Guarantee Tests for both units and issue of Operation Acceptance Certificate by the PMC	5%	T + 45 weeks
	Submission of final 'Overhaul Completion Report' approved by Authority	10%	T + 48 weeks
	Completion of defect liability (warranty period)	5%	18 (eighteen) months from the date of Completion of the Overhaul or 12 (twelve) months from the date of Operational Acceptance of the equipment, whichever first occurs
Overhaul execution	Mobilization fee	5%	T + 2 weeks
	Completion of overhaul and guarantee of auxiliary boiler (including hydro test and light up) and issue of completion certificate by PMC	10%	T + 10 weeks
	Monthly payments against progressive installation of equipment on site	15% (per month)	Monthly payments in equal installments for 3 months during Overhaul execution
	Completion of the Overhaul activities for auxiliary boiler, main boilers, and ESP for both units and issue of Completion Certificate by the PMC	10%	T + 42 weeks
	Completion of Guarantee Tests for both units and issue of Operation Acceptance Certificate by the PMC	15%	T + 45 weeks
	Submission of final 'Overhaul Completion Report' approved by Authority	10%	T + 48 weeks
	Completion of defect liability (warranty period)	5%	18 (eighteen) months from the date of Completion of the Overhaul or 12 (twelve) months from the date of Operational Acceptance of the equipment, whichever first occurs

1. The Successful Bidder shall submit invoices upon achieving milestones stated in sub clause hereinabove. Authority shall make payment within 30 days of submission of

invoices upon verifying the milestone for which invoice is submitted subject to deduction of any damages pursuant to Contract conditions

2. Applicable GST, over and above approved Lumpsum Charges for Boiler and ESP Package, at the time of invoicing shall be reimbursed by the Owner upon submission of proof thereof. The risk of applicability of any taxes, duties, and levies except GST, shall rest with the Successful Bidder
3. The Owner shall be entitled to deduct tax at source as may be applicable. The TDS certificate(s) shall be submitted as per the due date specified in the Income Tax Act

12. Insurance

12.1. Insurance of Equipment

Successful Bidder shall, at their sole cost, in the joint names of Owner, Successful Bidder, and the Sub-Contractors, take insurance cover for full replacement value for the following:

1. "Material Damage Insurance" (Storage-cum-Erection Insurance) on an “All Risk" basis (including terrorists act, SRCC) of loss or of damage arising during period of Insurance coverage to any part of the Contract works, material and supplies by Successful Bidder including any transit and off-site storage, and anywhere in India for ex-works Indian factory and foreign supplies, materials, etc.
2. Such insurance shall be administered and managed by the Successful Bidder and shall be affected from the Commencement date of Contract and thereafter shall operate from the time the relevant property leaves the premises of the manufacturers in the country of origin, and shall continue during the ordinary course of transit and during storage on or off the Plant site, if any, and during erection and commissioning until the date on which Owner takes over the care, custody, and control of the Plant/Equipment, to the exclusion of the Successful Bidder

12.2. Rented Equipment

1. All construction equipment shall be brought to and kept at the Site at the sole cost, risk and expense of the Successful Bidder. Owner shall not be liable for any loss or damage thereto. The Successful Bidder, at his sole discretion, may maintain adequate, appropriate and prudent insurance with respect to such construction equipment. The Successful Bidder shall obtain adequate insurance to cover all construction equipment rented or leased from third parties and also for the construction equipment of Sub-Contractor.
2. Any insurance policy carried by the Successful Bidder, any Sub-Contractor or any third party on or in respect of any construction equipment shall provide for waiver of the underwriter’s right to subrogation against Owner, their assignees, subsidiaries, parent companies, affiliates, employees, insurers, and underwriters.

12.3. Statutory Insurance Benefits

The Successful Bidder shall maintain with respect to the Work to be done under the Contract, in each applicable jurisdiction, all statutory benefits and other insurance required by law including without limitation unemployment insurance.

12.4. Third Party Insurance

1. Successful Bidder shall, in the joint names of Owner, Successful Bidder and the Sub-Contractor's prior to the commencement of any work in the Plant pursuant to this Agreement, insure in an amount not being less than project cost thereof against any liability for damage or death or personal injury occurring in the Plant, obstruction, loss of amenity, trespass, nuisance or advertising liability pursuant to the Contract. Such insurance shall be endorsed or amended as to be considered primary, and any other insurance maintained by Owner shall be in addition and not contributory to this insurance.
2. Indemnity amount indicated above shall be the minimum coverage that the Successful Bidder takes under the policy. Notwithstanding the above coverage, the Successful Bidder at their discretion will take policy for an appropriate coverage not less than the indemnification amount prescribed as above, so as to meet all the liabilities that may arise on account of third-party risks from the commencement of contract till the Owner takes over the care, custody, and control of the Plant, to the exclusion of Successful Bidder.

12.5. Insurance against Accident, etc. to Workmen; Other Insurance

The Successful Bidder shall, at its sole expense, insure and shall maintain insurance as required by Indian and all other applicable laws for all actions, suits, claims, demands, costs, charges, and expenses arising in connection with the death of or injury to any person employed by the Successful Bidder or its Sub-Contractor for the purpose of the performance of the Work.

12.6. Disclosure

Each Party shall, upon request, promptly furnish the other Party any information which is reasonably available and is related to the fulfillment of the contractual obligations as is necessary to enable the other Party to comply with its disclosure obligations under the insurance which it has taken out, the terms of which have been disclosed to the other Party in writing.

At the Owner's request, the Successful Bidder shall provide evidence of insurance covers, or a certificate of all insurances maintained.

12.7. Remedy on Failure to Insure

If the Successful Bidder fail to effect and keep in force the insurance for which it is responsible under the Contract, Owner may effect and keep in force any such insurance, and pay such premiums as may be necessary for that purpose, and from time to time, after receipt of a reimbursement request therefore accompanied by relevant supporting documentation, deduct the amount so paid by Owner from any amounts due or which may become due to the Successful Bidder under the Contract or otherwise from the Owner.

12.8. Limitation of Liability

Notwithstanding any other provisions, except in cases of criminal negligence or willful misconduct,

1. Whether expressed or implied, in no event, whether as a result of breach of contract, warranty, indemnity, tort (including negligence) strict liability or otherwise, shall either Party be liable to the other for loss of contract, loss of profit or revenue, loss of use, loss of data or information, loss of power, cost of replacement power, increased cost of operation and cost of capital or for any indirect, special, collateral, or consequential damages
2. The aggregate liability of the Successful Bidder to the Owner, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Value, provided that this limitation shall not apply to any obligation of the Successful Bidder to indemnify the Owner with respect to patent infringement.

12.9. Claims for losses/damages

1. Successful Bidder/Sub-Contractor shall make all claims with the underwriter/s and undertake all formalities/step required for settlement of claims
2. Successful Bidder/Sub-Contractor shall hold harmless the Owner for non-settlement/short settlement/part settlement or repudiation of claims by the underwriter/s
3. Successful Bidder shall be obliged to replace / repair the Equipment/ components/parts/spares etc., without waiting for loss settlement by the underwriter/s

13. Non fulfilment of terms and conditions and Termination of Contract

1. If at any time during the currency of this contract, if any breach occurs due to the reasons attributed to the Successful Bidder, the Owner shall be at liberty to terminate this contract without assigning any reasons, whatsoever, for such termination and any losses and/or damages occurring due to such termination shall be borne by the Successful Bidder.
2. If the Successful Bidder fails to carry out the work as per terms and conditions of the contract to the satisfaction of the Owner, the Owner shall be entitled to forfeit the Performance Security paid by the Successful Bidder as per Section 7.3 of Part 3 of this document. This, however, shall not absolve the Successful Bidder from its obligation to fulfill the contract. In such event, the Owner shall have a right to complete and / or to get the work completed at the cost & risk of the Successful Bidder and the Successful Bidder shall be responsible to pay such cost incurred by the Owner to complete the work and / or to get the work completed
3. Likewise, if the Successful Bidder does not fulfill the terms and conditions of the Contract and does not carry out the work up to the entire satisfaction of the Owner, the Owner has the right to forthwith terminate the Contract at its sole discretion, without assigning any reason, Under such events, the Owner shall be entitled to forfeit the Performance Security paid by the Successful Bidder as per Section 7.3 of Part 3 of this document, and the Owner shall have a right to complete the work and / or to get the work completed at the risk and cost of the Successful Bidder

4. For any reasons, if it is required, the Owner reserves rights to cancel, terminate, amend and / or alter the Contract and / or bifurcate and / or increase and/or reduce the Contract work at any time without giving any notice or reason to the Successful Bidder and without incurring any responsibility.

14. Contract terms and conditions

14.1. Statutory Obligations

1. That the Successful Bidder shall obtain license under the Bombay Shops and Establishment Act, and it shall pay wages and benefits in accordance with the applicable laws and shall not pay less than as notified by the Government Authorities from time to time and shall maintain the employment records as required under applicable laws
2. That the Successful Bidder shall get his own License under Contract Labor (Regulation and Abolition) Act. It shall be binding to get the same renewed from time to time and shall maintain all the records as per the act
3. That the Successful Bidder shall be responsible to enroll his employees, deduct, add, and deposit in the relevant accounts the contributions as required under the Employees State Insurance Act, 1952 and the Employees Provident Funds and Miscellaneous Provisions Act 1952 and any other enactment's covered under the various applicable labor laws as well as maintain all books of records for the staff and employees deputed by it for this contract such as required under any laws applicable. The Successful Bidder shall also furnish a copy of such statements as documentary proof to the Owner
4. That if the Successful Bidder is not covered under the Employees State Insurance Act, 1952 then it shall be the duty of the Successful Bidder to take appropriate insurance cover under the Workmen Compensation Act and take Group Personal Accident Policy for all the employees deputed at the project site
5. The Successful Bidder has to issue to the employee's Identity card with their photos and shall also maintain relevant register
6. That the Successful Bidder shall give leave/holiday to its workforce as per the provisions of labor laws applicable
7. Every person deployed by the Successful Bidder in a Plant must wear safety gadgets to be provided by the Successful Bidder
8. Any statutory clearance, permission required for the work, its completion, commissioning shall be in the Successful Bidder’s scope
9. The Successful Bidder will be required to obtain License from the office of the Labor Commissioner for the required strength of labor, before commencement of work at site and the same shall be maintained updated and valid throughout the currency of the contract
10. If any amount becomes payable by the Owner as a result of any claim or application in terms of the provisions or non-compliance of provision of the any Acts, and the Rules and Regulations, By-laws or the Orders made there under, applicable from time to time, such amounts shall be recoverable from the

Successful Bidder for which the Owner will not be responsible for any compensation

11. That the Successful Bidder would obey with all applicable laws and maintain all such necessary records as necessitated under such enactments
12. The Successful Bidder shall also indemnify the Owner against any claims, compensations, damages, loss, liquidated damages etc. for breach and / or non-fulfillment of the prevailing Rules and Regulations and other statutory provisions in force from time to time and applicable to the work during the currency of contract
13. The Successful Bidder shall comply with other statutory provisions of Law. The Successful Bidder shall comply with all applicable laws, ordinances, approved standards, rules, and regulations, and shall procure all necessary municipal and governmental permits, licenses and inspection and shall pay all fees and charges in connection with the items covered by the contract. The Successful Bidder shall serve the Owner harmless as a result of any in factions thereof. Successful Bidder will be solely liable for all non-compliances. The following are some of the major Government of India Acts and Regulations to be complied with by the Successful Bidder. The List is illustrative and not exhaustive.

a. The Factories Act of 1948 (63 to 1948) and Amendments and Rules (Amended up to date)
b. The Electricity Act, 2003 and rules made there under
c. The Indian Boiler Regulation Act, 1950 and rules made there under
d. The Minimum Wages Act, 1948
e. The Employees Compensation Act 1923 and Amendment Act 2010
f. The Payment of Wages Act 1936 and Amendment Act 2012
g. Payment of Bonus Act 1965 and Amended up to date
h. Contract Labor Regulations& Abolition Act 1970
i. Interstate Migrant Workmen (Regulations) Act 1979

14.2. Bankruptcy

1. If the Successful Bidder commits an act of Bankruptcy or goes into liquidation except for construction purposes, or if its business is carried on by a receiver, such receiver, liquidator or any person in whom the contract may become vested shall forthwith give notice thereof in writing to the Owner and in reasonable time during which he shall take all reasonable steps to prevent stoppage of performance of the contract, have the option of carrying out the contract subject to his or their providing such guarantees as may be required by the Owner but not exceeding the value of the work for the time being remaining unexecuted
2. In the event of stoppage of performance under the contract, the period of option under this clause shall be decided by the Owner considering the situation, provided that the above option is not exercised, the Owner may terminate the contract by serving notice in writing to the Successful Bidder. The power and provision so reserved to the Owner on taking of the work out of the Successful Bidder's hands shall apply as far as they may be when the contract is so terminated

14.3. Notice

Written notice shall be deemed to have been duly served if delivered to the individual or to Successful Bidder or to the Signing Authority of the Owner from whom it is intended, or if delivered at or sent by mail or post, to the last business address known to him who gives the notice.

14.4. Canvassing not Permitted

1. Successful Bidder should not canvass their offer personally or otherwise by approaching the Chairman or the Member of the Owner. If any Successful Bidder wants to make any representation regarding his offer, he should write to the General Manager (Power), if he desires, but personal and oral representations are not permitted
2. In spite of the above clear instructions, any Successful Bidder is found to canvass his offer or against his competitor's offer through personal approach to the competent authority or the officials of the Owner, their offer will be rejected without assigning any reason and the firm even is blacklisted

14.5. Indemnification

The Successful Bidder shall fully indemnify, save harmless and defend Owner, Owner's shareholders, the Owner, and the directors, agents and employees of the Owner (the "Owner Indemnified Parties") from and against any and all claims, including reasonable legal costs, (collectively the "Damages") by third Parties in respect of death or bodily injury or in respect to loss or damage to any property (other than the Plant or part there of not yet taken over) which arises out of or in consequence of the Services whilst the Successful Bidder has responsibility for the care of the works to the extent resulting from Successful Bidder's or their agents or employees intentional act, negligence, or strict liability or omission in the performance of the Services hereunder; provided that the foregoing obligation shall not apply to the extent the Owner Indemnified Parties are contributory negligent or strictly liable or to the extent such damages are caused by the intentional acts or omissions of the Owner Indemnified Parties. The Successful Bidder shall provide Undertaking of Indemnity, in the form of Annexure 14 of this document.

14.6. Arbitration

All questions, disputes, differences whatsoever which may at any time arises between the parties to this RFP and subsequent contract in connection with the RFP and subsequent contract or any matter arising out of or in relation thereto, shall be referred to Sole Arbitrator as per the provisions of Arbitration and Conciliation Act, 1996 and subsequent amendment thereto and the venue of arbitration proceedings shall be at Ahmedabad only. The Language of the Arbitration shall be in English only.

14.7. Governing Law

This RFP and subsequent Contract shall be construed and interpreted in accordance with and governed by the laws of India.

14.8. Jurisdiction

The matter related to any dispute or difference arising out of this RFP and subsequent contract shall be subject to the exclusive jurisdiction of Court at Ahmedabad only.

14.9. Completion of Work

1. Upon the Successful Bidder fulfilling the entirety of its obligations under the Contract to the satisfaction of the Owner and subject to terms and conditions of the Contract, it shall become eligible to apply for a Completion Certificate. The General Manger of the Owner shall formally issue the Completion Certificate, after verifying from the completion documents and satisfying himself that the Works under the Contract have been completed in accordance with all the provisions of this Contract. The Successful Bidder, after obtaining the Completion Certificate shall become eligible to present the final bill for the Works executed by it under the Contract
2. Upon completion of Works under the Contract and before the application for the Completion Certificate, the Successful Bidder shall clear the project of the Owner of all rubbish, dirt, structures, scrap, oily rags etc. Failure to clear the project may constrain the Owner to clear the said site at the risk and cost of the Successful Bidder
3. The Successful Bidder shall provide the Owner with any and all documents/records/proofs that may be demanded before issuance of Completion Certificate

14.10. Accident and Responsibilities of Successful Bidder

1. The entire responsibility on account of any accidents, damage or personal injury which may occurred to any of the Successful Bidder's vehicles/ equipment or his/its employees, or any outside party shall be exclusively that of the Successful Bidder and no claim whatsoever shall be entertain by the Owner on this account. The Successful Bidder shall keep the Owner indemnified from all the consequence
2. In the event of any breakdown or accident during the course of any operation, the Successful Bidder shall notify the facts to the Project Authority, or any other officer immediately present there of such incidence and shall simultaneously make adequate remedial arrangements on his/its own cost and risk and as per the instruction of the Project Authority
3. The Successful Bidder shall pay all claims, damages and compensation with cost arising out of or resulting there from to the third party(s) and in case the Owner would be required to face any proceedings all to pay any amount on the aforesaid account, it shall be deemed to have been discharge on behalf of the Successful Bidder, the same amount shall be recovered half-an hour rest interval in between. The Successful Bidder shall ensure that the attendance of all the supplied manpower shall be taken through biometric attendance machine

14.11. Foreclosure

1. In case of any necessity arising due to local working conditions or any unforeseen reason not in the control of the Owner or of the Successful Bidder, Committee comprising of representative of the Owner, Successful Bidder and Outside Expert from Technical and Financial background shall be constituted and Committee will look into the reasons/causes and analyze the conditions as to whether the work awarded is feasible to continue with the existing terms and conditions of the contract or any other available option or to Fore Close the contract in the interest of both the Owner and the Successful Bidder
2. If after study of the prevailing conditions of the contract under execution, committee recommends to Foreclose the contract keeping in view the financial implication to both the Owner and Successful Bidder, guideline/Modality of the Fore Closure of the contract shall be decided by the committee considering the work executed and unexecuted, period of the contract completed and balance period of the contract, value of the work executed and value of the work unexecuted etc.

14.12. Force majeure

1. Force majeure is herein defined as any cause which is beyond the control of the Successful Bidder or the Owner as the case may be which they could not foresee or with a reasonable amount of diligence could not have foreseen and which substantially affect the performance of the contract, such as:
2. Natural phenomena such as flood, draughts Cyclone, earthquake and epidemics, declaration of war
3. Acts of any government, including but not limited to war, declared or undeclared priorities, quantities, embargoes, providing either party shall within fifteen (15) days from the occurrence of such a cause notify the other in writing of such cases
4. The Successful Bidder will advise, in the event of his having resort to this clause by a registered letter duly certified by the statutory authorities, the beginning and end of the cause of delay, within fifteen days of the occurrence and cessation of such Force Majeure condition. In the event of delay lasting over two months, if arising out of Force Majeure, the contract may be terminated at the discretion of the Owner
5. For delay arising out of Force Majeure, the Successful Bidder will not claim extension in completion date for a period exceeding the period of delay attributable to the causes of Force Majeure and neither company nor the Successful Bidder shall be liable to pay extra costs (like increase in rates, remobilization, advance, idle charges for labor and machinery etc.) provided it is mutually established that the Force Majeure conditions did actually exist
6. If any of the Force Majeure conditions exists in the place of operation of the Successful Bidder even at the time of submission of bid, he will categorically specify them in his bid and state whether they have been taken into consideration in their quotations
7. The Successful Bidder or the Owner shall not be liable for delays in performing his obligations resulting from any Force Majeure cause as referred to and/ or defined

above. The date of completion will, subject to hereinafter provided, be extended by a reasonable time

Part 3: Instruction to Bidders

1. Introduction

1.1. Bidding process overview

GMDC has adopted a single stage two envelope Bidding system separately for Technical Bid and Price Bid with evaluation as per Quality cum Cost Based System (QCBS) method as detailed out in Section 5.4 of Part 3 of this document.

Technical Bid and Price Bid shall be submitted online through https://gmdc.nprocure.com.

The Bids for which the Price Bid is submitted in hard copy / physical form shall be rejected as non-responsive.

Complete Bid shall be submitted on or before the time and date fixed for submission of technical and price Bids as detailed in Section 1.6 of Part 3 of this document. Bids delivered after the due dates will be rejected.

The Bidders need to offer their Bids which conform to the scope of work and terms and conditions detailed in Part 2 of this document.

As a first step, evaluation of Technical Bid will be conducted as per Section 6.2 of Part 3 of this document. Post the evaluation of Technical Bids, the Price Bids of only those Bidders meeting the pre-qualification and technical criteria detailed in Sections 5.1 and 5.2 of Part 3 of this document shall be opened.

Subsequently, a Price Bid evaluation of technically qualified Bidders will be carried out as per Section 6.3 of Part 3 of this document. The Bids will finally be ranked from the highest to lowest according to their combined technical and price scores (described as 'Composite Score') derived based on the Quality cum Cost Based Score (QCBS) specified Section 5.4 of Part 3 of this document. The Bidder obtaining the highest composite score shall be considered as the 'Preferred Bidder'.

1.2. Due diligence

Before Bidding, the Bidder shall undertake and shall be deemed before Bidding to have undertaken a thorough study of the proposed work, the job(s) involved, the Plant conditions, the labor, power, water, material and equipment availability, transport and communication facilities and temporary offices and accommodation quarters, and all other factors, constraints, and facilities necessary for the formulation of the Bid, supply of materials and the performance of the work.

The Bidder shall inspect and examine the Plant and its surroundings and shall satisfy themselves before submitting their Bid as to the nature of the ground present, physical conditions and all roads, approaches and lands which may be used temporarily otherwise in connection with the works, means of access to the Plant accommodation they may require

and in general shall themselves obtain all necessary information as to risks, contingencies & other circumstances which may influence or affect their Bid.

The intending Bidders shall be deemed to have visited the Plant and familiarized themselves thoroughly with the working conditions at the Plant before submitting the Bid. Non-familiarity with the Plant conditions will not be considered a reason either for extra claims or for not carrying out the work in strict conformity with the specifications.

It will be imperative on each Bidder to acquaint himself of all local laws, conditions and factors which may have any effect on the execution of works and supplies under the Bid document. In their own interest, Bidder is requested to familiarize themselves with (but not limited to) the Indian Income Tax Act 1961, Indian Companies Act 2013, Customs Act 1962, Factory Act, Contract Labor Act 1970, Arbitration Act 1996, EPF Act 1952, Employees State Insurance Act (ESI) 1948 & other related applicable Acts and Laws & Regulations of India, with their latest amendments, as prevalent in India. Owner shall not entertain any request for clarification from the Bidder regarding such local conditions.

It must be understood and agreed that such factors have properly been investigated and considered while submitting the Bid. No claim for financial and other adjustments to the Contract price, on account of lack of clarity or proper understanding of such factors, shall be entertained.

1.3. Acknowledgement by Bidder

By submitting the Bid, the Bidder acknowledges that:

1. It has made a complete and careful examination of the scope of work and terms and conditions mentioned in Part 2 of this document
2. It has made available all the relevant information requested by GMDC
3. It accepts the risks of inadequacy, or error due to improper due diligence on its part as described in Section 1.2 of Part 3 of this document
4. It does not have any conflict of interest
5. It is bound by the undertakings provided by it under and in terms hereof

GMDC shall not be liable for any omission, mistake, or error in respect of any of the above or on account of any matter or thing arising out of or concerning or relating to the RFP or the Bidding Process, including any error or mistake therein or in any information or data given by GMDC.

1.4. Cost of Bidding

The Bidders shall be responsible for all of the costs associated with the preparation of their Bids and their participation in the Bid Process. GMDC will not be responsible or in any way liable for such costs, regardless of the conduct or outcome of the Bidding Process.

1.5. RFP Fee

Bidder shall have to submit non-refundable RFP Document Fee of INR 17,700 (i.e., RFP fee of INR 15,000 plus 18% GST). The RFP Document Fee shall be submitted in the form of a

Demand Draft in favor of "**Gujarat Mineral Development Corporation Limited**" and **payable at Ahmedabad** along with the Bid as per marking and sealing section. This Demand Draft for RFP document shall be non-refundable. Bids that are not accompanied by the RFP Fee in acceptable amount and form shall be considered non-responsive and shall be consequently rejected.

Relaxation in terms of submission of RfP fee shall be given to the bidder who is holding valid Certificate issued under the MSME Act, 2006 on the date of submission of Tender.

1.6. Schedule of Bidding

The key activities and timelines for the Bidding process have been detailed below. While GMDC shall endeavor to adhere to the timelines, it is subject to approvals and other external contingencies.

Category	Activity	Schedule
RFP release	Issuance of Bid package to Bidders	RFP shall be available from 02th August 2023 from the website http://www.gmdcltd.com and https://gmdc.nprocure.com
Bid queries	Deadline for receiving queries from Bidder	Bidders may send their queries by 17th August 2023 up to 1700 hrs. on the following e-mail ID: jndave@gmdcltd.co.in, power@gmdcltd.co.in
	Pre-Bid meeting	The pre-Bid meeting shall be held at 1100 hrs. on 23rd August 2023 at the following address: Gujarat Mineral Development Corporation Ltd Khanij Bhavan, 132-Ring Road, Gujarat University Ground, Vastrapur, Ahmedabad- 380052
Bid submission and evaluation	Online submission of Price Bid	Bidders shall submit their Price Bids online on https://gmdc.nprocure.com on or before 11th September 2023
	Submission of Technical Bid (hard copy), RFP Fee and EMD in person	Bidders shall submit their Technical Bids on or before 12th September 2023 up to 1800 hrs. at the following address: Gujarat Mineral Development Corporation Ltd Khanij Bhavan, 132-Ring Road, Gujarat University Ground, Vastrapur, Ahmedabad- 380052 The Technical Bid, RFP fee, and EMD shall be made by Speed Post / RPAD / Hand / Courier
	Technical presentations by Bidders	To be informed to the Bidder in advance
Vendor selection	Evaluation of Technical and Price Bids and selection of Vendor	To be informed to the Bidder after the Bid submission date

2. Bid requirements

2.1. Bid validity

Bids shall remain valid for a period of not less than 180 (one hundred and eighty) days from the Bid submission date (described as 'Bid Validity Period'). The Bid shall be considered non-responsive if such Bid is valid for a period less than the Bid Validity Period.

In exceptional circumstances, prior to expiry of the original Bid Validity Period, relevant authorities from GMDC may request the Bidders to extend the period of validity for a specified additional period. The request and the responses thereto shall be made in writing. A Bidder may refuse the request without forfeiting its Bid Security / EMD. A Bidder agreeing to the request will not be required or permitted to modify his Bid but will be required to extend the validity of his Bid Security/EMD for the period of the extension, and in compliance with Section 2.5 of Part 3 of this document in all respects.

2.2. Number of Bids by Bidder

No Bidder shall submit more than one Bid pursuant to this RFP. If a Bidder submits or participates in more than one Bid, such Bids by the Bidder shall be disqualified.

2.3. Governing law and jurisdiction

The Bidding process shall be governed by and construed in accordance with the Indian laws and the courts at Ahmedabad, Gujarat shall have exclusive jurisdiction over all disputes arising under, pursuant to, and / or in connection to the Bidding process.

2.4. GMDC's right to accept and reject any Bids or all Bids

Notwithstanding anything contained in this RFP, GMDC reserves the rights to accept or reject any Bid and to annul the Bidding process / Bid evaluation process and reject all Bids at any time without any liability or any obligations for such acceptance, rejection, or annulment, without assigning any reasons thereof.

It shall be deemed that by submitting the Bids, the Bidder agrees and releases GMDC, its employees, agents and advisers, irrevocably, unconditionally, fully and finally from any and all liability for claims, losses, damages, costs, expenses or liabilities in any way related to or arising from the exercise of any rights and / or performance of any obligations hereunder, pursuant hereto and / or in connection to the Bidding process and waives, to the fullest extent permitted by Applicable Laws, any and all rights and/or claims it may have in this respect, whether actual or contingent, whether present or in future.

Without prejudice to the generality of the above terms, GMDC reserves the right to reject any Bid if:

1. The Bid does not meet the technical eligibility and qualification criteria specified in this RFP
2. A material misrepresentation is made or discovered at any time, or if the Bidder is found to be indulging in fraudulent and corrupt practices

3. The Bidder does not provide, within the time specified by GMDC, the supplemental information sought by GMDC for evaluation of the Bid
4. The Bidder submits a conditional Bid

If such disqualification / rejection occurs after the Bids have been opened and the Preferred Bidder as per award criteria gets disqualified / rejected, then GMDC reserves the right to consider the next best Bidder or take any other measure as may be deemed fit in the sole discretion of GMDC, including annulment of the process.

2.5. Earnest Money Deposit (EMD) / Bid Security

The Bidder shall furnish a separate Bid Security (described as 'Earnest Money Deposit') as part of its Bid as per the given format. The Bid Security / EMD shall be sealed in separate sealed envelope along with the RFP fee, as described in Section 4.4 of Part 3 of this document. An amount of INR 3 Cr shall be approved as EMD from the banks approved by Government of Gujarat except cooperative banks, in favor of "Gujarat Mineral Development Corporation Ltd." The list of approved banks has been listed in Annexure 16.

The EMD shall be in any of the below mentioned format:

1. Account payee Demand Draft / Banker's Cheque
2. An irrevocable Bank Guarantee, as per Annexure 16, payable at Ahmedabad and valid for a period of 210 (two hundred and ten) days from the Bid submission date in the prescribed format. The validity of the bank guarantee may be extended as per mutual agreement between GMDC and the Bidder, as per Section 2.1 of Part 3 of this document

Any Bid not accompanied with valid Earnest Money Deposit and RFP fee in the acceptable amount, form, and validity period will be summarily rejected by GMDC as being non-responsive and Bids of such Bidder shall not be evaluated further. The Bidder shall also submit a blank cheque along with the bid submission, providing the Bidder's bank details to GMDC.

GMDC shall not be liable to pay any interest on the Bid Security/EMD deposit and the same shall be interest free.

The EMD shall be furnished in Indian Rupees only.

The Bid Security of unsuccessful Bidders will be returned by GMDC, as promptly as possible on acceptance of the Bid of the Preferred Bidder or if and when GMDC cancels the Bidding process. Where Bid Security has been paid by Demand Draft/ Banker's Cheque deposit, the refund thereof shall be in the form of an account payee demand draft in favor of the unsuccessful Bidder(s). Bidders may, by specific instructions in writing to GMDC, give the name and address of the person in whose favor the said demand draft shall be drawn by GMDC for refund, failing which it shall be drawn in the name of the Bidder and shall be mailed to the address given on the Bid.

The Preferred Bidder's EMD will be returned, without any interest, upon the Preferred Bidder signing the Agreement and furnishing the Performance Security in accordance with the provision thereof or if and when GMDC cancels the Bidding.

GMDC shall be entitled to forfeit and appropriate the Bid Security as damages inter alia in any of the events specified below. The Bidder, by submitting its Bid, shall be deemed to have acknowledged and confirmed that GMDC will suffer loss and damage on account of withdrawal of its Bid or for any other default by the Bidder during the period of Bid validity as specified in this RFP. No relaxation of any kind on Bid Security shall be given to any Bidder.

1. If a Bidder engages in corrupt, fraudulent, coercive, undesirable, or restrictive practices as specified in Section 8 of Part 3 of this document
2. If a Bidder withdraws its Bid during the Bid validity period as specified in this RFP and as extended by mutual consent of the respective Bidder(s) and GMDC
3. In the case of a Successful Bidder if it fails within the specified time limit:
    a. to sign and return the duplicate copy of LOA
    b. to sign the Agreement within the time period specified by GMDC
    c. to furnish the Performance Security within the period prescribed therefore in the RFP, or commits any breach prior to furnishing the Performance Security

Relaxation in terms of submission of EMD shall be given to the bidder who is holding valid Certificate issued under the MSME Act, 2006 on the date of submission of Tender.

3. Pre-Bid activities

3.1. Content of the RFP

This RFP comprises of the content listed below and may additionally include any addenda issued in accordance with Section 3.4 of Part 3 of this document.

Part 1: Introduction

Part 2: Terms of reference / Scope of work

Part 3: Instructions to Bidders

Part 4: Annexures

3.2. Clarification to RFP document

Bidders requiring any clarification on the RFP may notify GMDC in writing through email at the address provided in Section 1.6 of Part 3 of this document.

Bidders must send in their queries on or before the date mentioned in Section 1.6 of Part 3 of this document in order to enable GMDC to have adequate notice of the said queries so that the same can be addressed at the Pre-Bid Meeting or shortly later.

GMDC shall endeavor to respond to the queries within a short span of time prior to the Bid submission date.

GMDC is not bound to take cognizance of any queries raised after the date specified in Section 1.6 of Part 3 of this document.

GMDC shall endeavor to respond to the questions raised or clarifications sought by the Bidders. However, GMDC reserves the right not to respond to any question or provide any

clarification, at its sole discretion, and nothing in this section shall be taken or read as compelling or requiring GMDC to respond to any question or to provide any clarification.

GMDC may also on its own motion, if deemed necessary, issue interpretations and clarifications and amendment to RFP. All clarifications and interpretations issued by GMDC shall be deemed to be part of the Bidding documents. Verbal clarifications and information shall not in any way or manner be binding on GMDC.

3.3. Pre-Bid meeting

A pre-Bid meeting would be held at time and an address specified in Section 1.6 of Part 3 of this document. Bidders are advised to attend the meeting and will do so at their own expense.

During the course of pre-Bid meeting, the Bidders will be free to seek clarifications and make suggestions for consideration of GMDC. GMDC shall endeavor to provide clarifications and such further information as it may, in its sole discretion, considered appropriate for facilitating a fair, transparent, and competitive Bidding process.

Responses to Bidders' clarification would be shared by uploading such responses online on GMDC's website (i.e. http://www.gmdcltd.com and https://gmdc.nprocure.com), if required, in the form of an addendum and or corrigendum.

Non-attendance at the pre-Bid meeting shall not be a cause for disqualification of a Bidder. However, terms and conditions of the addendum(s) shall be legally binding on all the Bidders irrespective of their attendance at the pre-Bid meeting.

3.4. Amendment of Bidding documents

At any time prior to the Bid submission date, GMDC may, for any reason, whether at its own initiative or in response to clarifications requested by a Bidder, modify the RFP by the issuance of an addenda/corrigendum.

Any addendum/corrigendum issued hereunder will be in writing and shall be uploaded on GMDC's website http://www.gmdcltd.com and https://gmdc.nprocure.com.

In order to afford the Bidders a reasonable time for taking an addendum into account, or for any other reason, GMDC may, in its sole discretion, extend the Bid submission date.

4. Preparation and submission of Bids

4.1. Language of Bid

The Bids and all related correspondence and documents in relation to the Bidding process shall be in English language. All supporting documents and printed literature furnished by the Bidders with the Bid may be in any other language provided that they are accompanied by translations in the English language, duly authenticated and certified by the Bidder.

The Bidders shall ensure that any number mentioned in the Bid shall be followed by words in relation to such numerical format of the number, and in the event, there is a conflict in the numerical and the word format of the number, the number provided in words shall prevail.

4.2. Bid currency

All prices quoted in the Bid shall be quoted in Indian National Rupee(s) (INR).

4.3. Format and signing of Bid

The Bidder shall provide all the information sought under this RFP. GMDC will evaluate only those Bids that are received in the required formats and complete in all respects.

The Bid must be properly signed by the authorized signatory as detailed below:

1. Proprietor, in case the Bidder is a proprietary firm, or
2. Duly authorized person holding a Power of Attorney, in case Bidder is either a Limited Company or a Limited Liability Partnership firm

In case of the Bidder being Company incorporated under Indian Companies Act 1956/2013, the Power of Attorney shall be supported by a Board Resolution in favor of the person vesting power to the person signing the Bid.

4.4. Sealing and marking of Bids

4.4.1 EMD and RFP fee

The original instruments of the Bid Security of the required value and in the approved format as specified in Section 2.5, along with the RFP fee as specified in Section 1.5 shall be sealed in an envelope on which the following shall be superscribed:

"**RFP No. GMDC/Power/ATPS/05/23-24 for Boiler and ESP Package for Overhaul of GMDC's 250 (2x125) MW Akrimota Thermal Power Station (ATPS), Gujarat".**

4.4.2 Technical Bid

The technical Bid shall be submitted in hard copy and shall include the following documents:

S. No	Reference	Document details
1	Annexure 2	Unit rates for items listed in the BoQ for Boiler in soft copy (excel format) and hard copy
2	Annexure 3	Unit rates for items listed in the BoQ for ESP in soft copy (excel format) and hard copy
3	Annexure 5	Letter of Bid submission signed by authorized signatory of Bidder
4	Annexure 6	Bidder's experience and credentials – Certificate of incorporation, MoA, AoA, GSTIN registration – Evidence for work experience of similar nature – copy of work order, Contract and completion certificate, or Contract awarded, and threshold amount received if client documents are confidential
5	Annexure 7	Declaration of Key Personnel as per requirements of the RFP
6	Annexure 8	Statutory auditor/registered chartered accountants statement

S. No	Reference	Document details
		specifying revenue for last three financial years, net worth, and working capital for last financial year
7	Annexure 9	No blacklisting certificate on Istamp paper
8	Annexure 10	No deviation certificate
9	Annexure 11	Authorization of signatory in the form of Board Resolution/ or Power of Attorney (POA notarized and Applicable in case of Bid not being signed by the person directly authorized by the firm), as applicable
10	Annexure 12	Undertaking
11	Annexure 13	Undertaking of Indemnity
12		RFP documents issued along with updated addendums/amendments thereto, duly signed by the Bidder through its authorized signatory on all pages.

The documents required as part of the Technical Bid shall be submitted in hard copy in person as per the required format. All the documents shall be placed and sealed in an envelope on which the following shall be superscribed:

"**RFP No. GMDC/Power/ATPS/05/23-24 for Boiler and ESP Package for Overhaul of GMDC's 250 (2x125) MW Akrimota Thermal Power Station (ATPS), Gujarat– Technical Bid".**

Both envelopes specified in sections 4.4.1 and 4.4.2 shall be placed in an outer envelope and the following shall be superscribed:

"RFP No. GMDC/Power/ATPS/05/23-24 for Boiler and ESP Package for Overhaul of GMDC's 250 (2x125) MW Akrimota Thermal Power Station (ATPS), Gujarat – Bid Submission".

4.4.3 Price Bid

Price Bid shall be duly filled by the Bidder at designated places on https://gmdc.nprocure.com as per the format provided in the Annexure 14.

4.5. Bid submission date

The last date and time of submission of the Bids (the "Bid submission date") are specified in Section 1.6. The Bidders shall duly submit their Technical and Price Bids according to the dates specified.

GMDC may, in its sole discretion, extend the Bid submission date by issuing an addendum uniformly for all Bidders as per Section 3.4. In such event, the extended Bid submission date shall be applicable for all Bidders. Any such change in the Bid submission date shall be notified to the Bidders by uploading the addenda on GMDC's website http://www.gmdcltd.com and https://gmdc.nprocure.com.

4.6. Late submission

Physical submissions for Technical Bid and EMD and RFP fee received by GMDC after the specified time and date shall not be eligible for consideration and shall be summarily rejected.

GMDC shall not be responsible for any delay or non-receipt / non-delivery of any documents/ or technical issues pertaining to online Bid. The Bidder is expected to take its registration for e-tendering well in time and complete all procedure relating to e-submission well in time so that there is time for handling any technical glitches. Bidders who are not familiar with the procedure for online Bidding may use the training made available by e Bidding platform nProcure. The contact details of nProcure are as follows:

nCode Solutions (A Division of GNFC Ltd.)
403, GNFC Infotower, Bodakdev,
Ahmedabad - 380054. India
Sales : 079- 4000 7323
Support : 079- 4000 7300
Email : nprocure@ncode.in

4.7. Modification and withdrawal of Bids

Bidder shall not be able to modify any part of its Bid after the Bid submission date. In order to avoid forfeiture of Bid Security, a Bidder may withdraw its Bid after online submission thereof. The Bidder may modify, substitute, or withdraw its Bid online after submission, prior to the Bid submission date.

Any alteration/ modification in the Bid or additional information supplied subsequent to the Bid submission date, unless the same has been explicitly sought for by GMDC, shall be disregarded.

5. Bid evaluation criteria

5.1. Pre-qualification criteria

Category	Parameter	Supporting docs
Statutory	Registered in India under Indian Companies Act 1956/2013 or Limited Liability Partnership firm registered under LLP act in India	Registration certificate/certificate of Incorporation of business
	At least one office in India which has been operational for the last three years or more	Certificate of incorporation, MoA, AoA, GSTIN registration
	Not blacklisted by any Public Sector Undertaking (PSU) / Central or State Government in India / Central or State Government undertaking	- No blacklisting certificate - On 300 Rs. Stamp paper
	Consortiums are not permitted to participate in the Bidding process	

Category	Parameter	Supporting docs
Financial	Average audited annual revenue of INR 40 Cr per annum for last three years (FY2020 to FY2022)	- Revenue and net worth statement - On auditor's / CA's letterhead, signed with seal
	Positive net worth as on 31st March 2022	- Revenue and net worth statement - On auditor's / CA's letterhead, signed with seal
Operational	At least one Contract of similar works[2] of value > INR 76 Cr, or two Contracts of value > INR 47.5 Cr, or three Contracts of value > INR 38 Cr in the last seven years (FY2017 to FY2023)	Relevant portions of the work order /Contract / completion certificate for Contracts undertaken. In case the client serviced is confidential, the Bidder shall provide a self-certification with document evidence including work order / relevant sections of the contract / agreement. In case the similar work has been done in-house, self-certification with a logical methodology to assess the value of the work.
	Valid Special Grade Boiler Repairer / Erector License under the purview of Indian Boiler Regulations, 1950 issued by the Directorate of Boilers, Gujarat, or statutory authorities of any other states of India	License issued by IBR
	Minimum one project undertaken involving the EPC / ETC / Overhauling of CFBC boilers for coal/lignite thermal power plants	Relevant portions of the work order /Contract / completion certificate for Contracts undertaken. In case the client serviced is confidential, the Bidder shall provide a self-certification with document evidence including work order / relevant sections of the contract / agreement. In case the similar work has been done in-house, self-certification with a logical methodology to assess the work.
	Minimum one project undertaken involving the overhauling of boilers above 120 kg/cm^2 for coal/lignite thermal power plants	

[2] Similar works can include EPC / ETC / R&M / Overhaul / Retrofitting / Maintenance of Boilers and or ESP as part of a single Contract / Agreement / Work Order for a thermal power plant of capacity 250 MW or higher, with each unit of 100 MW or higher **OR** process industries with boilers of capacity 200 TPH or higher.

5.2. Technical Score

The Technical Bids of Bidders meeting pre-qualification criteria shall be considered for evaluation and assignment of technical scores. The technical evaluation will be conducted in two steps, evaluation of technical Bids and evaluation of technical presentation. The Technical Score (TeS) will be computed as the sum of the scores in technical Bid and technical presentation.

5.2.1. Technical Bid

The score of the Bidder's Technical Bid shall be evaluated as per the scoring system detailed below.

Category	Criteria	Thresholds	Score	Verification
Prior Experience *(40 marks)*	Largest individual boiler EPC / ETC / R&M / Overhaul undertaken for a coal or lignite-based thermal power Plant	10 points - >= 400 TPH 8 points - >= 350 TPH 6 points - >= 300 TPH 4 points - >= 250 TPH 2 point - >= 200 TPH 0 points - < 200 TPH	10	Document evidence including relevant portions of the work order / Contract / completion certificate for contracts undertaken (Annexure 6)
	Number of projects undertaken involving the EPC / ETC / R&M / Overhauling of CFBC boilers	10 points - >= 5 projects 8 points - 4 projects 6 points - 3 projects 4 points - 2 projects 2 points – 1 project 0 - no projects	10	
	Number of projects undertaken involving the Overhauling boilers operating above 120 kg/cm2	10 points - >= 5 projects 8 points - >= 4 projects 6 points - >= 3 projects 4 points - >= 2 projects 2 point - >= 1 project 0 points – no projects	10	
	Number of projects undertaken involving the erection or retrofitting of ESP	10 points - >= 5 projects 8 points - >= 4 projects 6 points - >= 3 projects 4 points - >= 2 projects 2 point - >= 1 project 0 points – no projects	10	
Workforce Capabilities *(20 marks)*	Boiler Package leader's years of experience	10 points - 15+ years' 5 points - <15 years' 0 points - <12 years	10	Self-declaration of workforce capabilities (Annexure 7)
	ESP Package leader's years of experience	10 points - 15+ years' 5 points - <15 years' 0 points - <12 years	10	
Technical Presentation *(40 marks)*	As per scores defined in Section 5.2.2	As per scores defined in Section 5.2.2	40	
	Total		**100**	

5.2.2. Technical Presentation

The Technical Bid will be accompanied by a Technical Presentation to the Bid evaluation committee. Bidders shall prepare a presentation in PPT format and will be

evaluated along the parameters detailed below. The Bidder shall, therefore, ensure appropriate details are incorporated in the presentation to be evaluated comprehensively. The score of the Bidder's Technical Presentation shall be evaluated as per the scoring system detailed below.

Category	Parameter	Score
Technical capabilities *(10 marks)*	Successful case studies of performance improvement of CFBC Boilers at coal or lignite based thermal power projects post Overhauling or R&M	10
Key personnel *(10 marks)*	Personnel with prior experience in Overhauling of CFBC Boilers and retrofitting of ESPs at coal or lignite based thermal power plants	10
	Proposed team, including details of the 'Boiler Package Leader' and 'ESP Package Leader'	
Approach and methodology *(20 marks)*	Plan for Procurement of all equipment / material / spares / services / works for the Overhaul and estimated timelines	20
	Plan for timely execution of Overhaul activities at Plant post procurement, including potential risk mitigation measures	
	Plan for testing (FATs, SATs, and Performance Guarantee Tests) and commissioning of the Boilers and ESPs	
	Total	**40**

5.3. Financial Score

The Bidders obtaining a Technical Score (sum of scores of Technical Bid and Technical Presentation) of minimum 70 (seventy) shall be considered as technically qualified Bidders. The Price Bid of only the technically qualified Bidders shall be opened.

The Bidders shall be required to quote the Lumpsum Charges for Boiler and ESP Package for the duration of the Contract, through online submission of Price Bids.

The Financial Score shall then be evaluated as follows:

$$\text{Financial Score(FiS)} = \frac{\text{FiL}}{\text{FiC}} \times 100$$

Where,

FiL is the L1 (Lowest Bidder)'s Lumpsum Charges for Boiler and ESP Package

FiC is the Lumpsum Charges for Boiler and ESP Package quoted by the Bidder

The Bidder recording the lowest aggregate Supply and Services charges for the tenure of the Contract among all technically qualified Bidders shall be given maximum score of 100.

5.4. Composite score

The Composite Score of the Bidders shall be computed using the Technical Score and the Financial Score as follows:

Composite Score (CS) = Technical Score (TeS) × 70% + Financial Score (FiS) × 30%

The technical criteria have been assigned a weightage of 70% while the commercial criteria have been assigned a weightage of 30%.

The Bidder obtaining the highest Composite Score shall be declared the Preferred Bidder. In case of a tie between two or more Bidders based on the Composite Score (i.e., two or more Bidder obtain the same Composite Score), the Bidder securing the higher Technical Score (TeS) among the tied Bidders shall be declared as the Preferred Bidder.

After discussions at the discretion of GMDC, the LOA would be granted to the Preferred Bidder who would then be the Successful Bidder with whom the Agreement shall be signed.

6. Bid evaluation process

6.1. Opening of technical Bid

The Bidder's names, the presence or absence of requisite RFP Fee and Bid Security and such other details, as GMDC in its sole discretion may consider appropriate, shall be announced at the opening of Technical Bid.

GMDC will subsequently examine and evaluate Technical Bids in accordance with the provisions set out hereunder in Section 6.2.

6.2. Evaluation of technical Bid

The Bidders shall be required to submit documents as per Section 4.4.2 along with supporting documents. GMDC shall examine and evaluate the Technical Bids as per the evaluation steps specified below.

6.2.1. Test of responsiveness

Prior to evaluation of the Technical Bids, GMDC shall determine whether each Bid is responsive to the requirements of the RFP. A Bid shall be considered responsive only if:

1. The EMD, RFP Fee, and Technical Bids are submitted in hard copy as per the appropriate formats in person as per Section 4.4.1 and 4.4.2 within the Bid submission date
2. The Price Bid is submitted online as per the appropriate format within the Bid submission date
3. It does not contain any conditionality
4. It is not non-responsive to the terms hereof and any other condition specified elsewhere in the RFP

GMDC reserves the right to reject any Bid which is non-responsive and no request for alteration, modification, substitution, or withdrawal shall be entertained by GMDC in respect of such Bid.

Evaluation of pre-qualification criteria and document checks of only those Bidders shall be carried out whose Bids determined to be responsive.

6.2.2. Assessment of pre-qualification criteria

GMDC shall examine and evaluate the pre-qualification of each Technical Bid upon determining its responsiveness as per Section 6.2.1.

The Bidder must meet pre-qualification criteria specified in Section 5.1 and have submitted all documents as per Section 4.4.2 in order to qualify for next stage of assessment.

Evaluation of Technical Bids to assign Technical Score of only those Bidders shall be carried out whose Bids are meeting the pre-qualification criteria and submitted all required documents.

6.2.3. Determination of technical score

GMDC shall examine and assign Technical Score to each pre-qualified Bid as per the scoring mechanism described in Section 5.2

The Technical Score of each Bid shall be calculated as the sum of the scores obtained in Technical Bid.

The Bids of the Bidders determined to be responsive, meeting the pre-qualification criteria, and obtaining a Technical Score of minimum 70 will be declared as technical qualified Bids, and the Bidders thereby shall be declared as technically qualified Bidders.

6.3. Evaluation of Price Bid

The Bidders shall be required to submit documents as per Section 4.4.3. GMDC shall examine and evaluate the Price Bids as per the evaluation steps specified below.

6.3.1. Opening of Price Bid

The Price Bids of only the Bidders determined to be responsive and meeting the Pre-Qualification Criteria and obtaining required Technical Score in accordance with Section 6.2 shall be opened.

The time and date of opening of Price Bids shall be informed to the Bidders who are declared as technical qualified Bidders pursuant to Section 6.2.3 in advance. The name of Bidder, Bid rates, etc. will be announced at such opening.

6.3.2. Determination of financial score

GMDC shall determine the Financial Score for each technical qualified Bid as specified in Section 5.3.

6.4. Determination of composite score

The Technical Score and Financial Score obtained by the Bidder shall be combined as per the formula provided in Section 5.4.

The Bidder obtaining the highest Composite Score shall be declared the Preferred Bidder. In case of a tie between two or more Bidders based on the Composite Score (i.e., two Bidder

obtain the same Composite Score), the Bidder securing the higher Technical Score (TeS) among the tied Bidders shall be declared as the Preferred Bidder.

After discussions at the discretion of GMDC, the LOA would be granted to the Preferred Bidder who would then be the Successful Bidder with whom the Agreement shall be signed.

6.5. Clarification of Bids and request for information

To facilitate evaluation of Bids, GMDC may, at its sole discretion, seek in writing, clarifications / documents / missing information from any Bidder pertaining to its Bid. If the response from the Bidder is not received by GMDC before the expiration of the deadline prescribed in the written request, GMDC reserves the right to proceed with the evaluation process at the total risk and cost of the Bidder.

6.6. Verification and disqualification

GMDC reserves the right to verify all statements, information and documents submitted by the Bidder in response to the RFP and the Bidder shall, when so required by GMDC, make available all such information, evidence and documents as may be necessary for such verification. Any such verification or lack of such verification by GMDC shall not relieve the Bidder of its obligations or liabilities hereunder nor will it affect any rights of GMDC there under.

GMDC reserves the right to reject any Bid and / or appropriate EMD if:

1. At any time, a material misrepresentation in terms of misleading or false representation is made or uncovered, or
2. The Bidder does not provide, within the time specified by GMDC, the supplemental information sought by GMDC for evaluation of the Bid
3. In case of fraudulent Bid and the Bidder is found to be involved in fraudulent and corrupt practice as per Section 8
4. In case the Bidder has any conflict of interest as per Section 9
5. A Bidder makes an effort to influence GMDC in its decisions on the evaluation process / selection process
6. While evaluating the Bid, if it comes to GMDC's knowledge expressly or implied, that some Bidders may have compounded in any manner whatsoever or otherwise joined to form an alliance resulting in distorting competitive price discovery or delaying the processing of proposal
7. Record of poor performance such as abandoning the work, rescinding of Contract for which the reasons are attributable to the non-performance of the Bidder, consistent history of litigation awarded against the applicant or financial failure due to bankruptcy
8. A Bidder submits or participates in more than one Bid under this RFP

If such disqualification / rejection occurs after the Bids have been opened and the Preferred Bidder as per award criteria gets disqualified / rejected, then GMDC reserves the right to consider the next best Bidder or take any other measure as may be deemed fit in the sole discretion of GMDC, including annulment of the process.

In case it is found during the evaluation of Bids or at any time before signing of the Contract or after its execution and during the period of subsistence thereof, that one or more of the

pre-qualification criteria / technical criteria have not been met by the Bidder, or the Bidder has made material misrepresentation or has given any materially incorrect or false information, the Bidder shall be disqualified forthwith if not yet appointed as the Bidder either by issue of the LOA or entering into the Contract, and if the Successful Bidder has already been issued the LOA or has entered into the Contract, as the case may be, the same shall, notwithstanding anything to the contrary contained therein or in this RFP, be liable to be terminated, by a communication in writing by GMDC to the Successful Bidder or the Bidder, as the case may be, without GMDC being liable in any manner whatsoever to the Successful Bidder or the Bidder. In such an event, GMDC shall be entitled to forfeit and appropriate the EMD or Performance Security, as the case may be, without prejudice to any other right or remedy that may be available to GMDC under the RFP and/or the Contract.

6.7. Contacts during Bid evaluation

Bids shall be deemed to be under consideration immediately after they are opened and until such time GMDC makes official intimation of award/ rejection to the Bidders. While the Bids are under consideration, Bidders and/ or their representatives or other interested Parties are advised to refrain, save and except as required under the Bidding documents, from contacting by any means, GMDC and/ or their consultants/ employees/representatives on matters related to the Bids under consideration.

6.8. Correspondence with Bidder

Save and except as provided in this RFP, GMDC shall not entertain any correspondence with any Bidder in relation to acceptance or rejection of any Bid.

6.9. Confidentiality

Information relating to the examination, clarification, evaluation, and recommendation for the Bidders shall not be disclosed to any person who is not officially concerned with the process or is not a retained professional advisor advising GMDC in relation to, or matters arising out of, or concerning the Bidding process. GMDC will treat all information, submitted as part of the Bid, in confidence and will require all those who have access to such material to treat the same in confidence. GMDC may not divulge any such information unless it is directed to do so by any statutory entity that has the power under law to require its disclosure or is to enforce or assert any right or privilege of the statutory entity and/ or GMDC or as may be required by law or in connection with any legal process.

7. Appointment of Bidder

7.1. Notification of award

Prior to expiry of the Bid Validity Period, GMDC shall notify the Preferred Bidder as the Successful Bidders through letter that their Bid has been accepted. This letter (“Letter of Award”/ “LOA”) shall be issued, induplicate, and shall specify the sum which GMDC shall pay to the Successful Bidder and sum that the Successful Bidder shall pay to GMDC in consideration of scope as per the terms of Contract.

Successful Bidder shall, within 7 (seven) days of the receipt of the LOA, sign and return the duplicate copy of the LOA in acknowledgement thereof. In the event the duplicate copy of the LOA duly signed by the Successful Bidder is not received by the stipulated date, GMDC may, unless it consents to extension of time for submission thereof, appropriate the Bid Security of such Bidder as damages on account of failure of the Successful Bidder to acknowledge the LOA, and the next eligible and qualified Bidder may be considered.

7.2. Signing of agreement

After acknowledgement of the LOA as aforesaid by the Successful Bidder, it shall cause the Successful Bidder, subject to furnishing the Performance Security as per the RFP provisions, to execute/sign the Agreement within the 30 (thirty) days from the date of LOA .

The Successful Bidder shall get correct amount of Stamp Duty adjudicated (Stamp Paper of Rs. 300 denominations can be used), at Ahmedabad in accordance with Applicable Law and submit the same in two copies duly stamped and executed within 30 (thirty) days from the dispatch of Letter of Award. GMDC shall return one copy duly sealed and signed as a token of acceptance of the Contract. Stamp Duty, and any other charges as may be levied under Applicable Law, shall be paid by the Successful Bidder.

After the signing of Agreement, the Successful Bidder shall be called the “Contractor”.

7.3. Performance Security

The Successful Bidder shall furnish Performance Security to GMDC for securing the due and faithful performance of its obligations under the Agreement, within 7 (seven) days from the date of acceptance of LOA, in the form of Demand Draft or an unconditional and irrevocable bank guarantee (Annexure 16) for amount of equivalent to 10% (Ten percent) of the Lumpsum Charges for Boiler and ESP Package (without GST) quoted, payable to GMDC by the Successful Bidders (the “Performance Security”) from the banks approved by Government of Gujarat except Co-Operative banks . Such Performance Security shall be in favor of “Gujarat Mineral Development Corporation Ltd” and admissible and payable at Ahmedabad branch from approved bank to GMDC. The list of approved banks has been listed in Annexure 17.

The Successful Bidder will be bounded for conflict resolution for a period of 12 (twelve) months after the completion of the Contract. Hence, the Bidder shall maintain a valid and binding Performance Security for a period of 24 (twenty-four) months. The Bidder shall ensure that the Performance Security shall subsist in full force and effect in terms hereof, throughout the tenure of the Contract and thereafter until expiry of 24 (twenty-four) months. In case tenure of the Contract is extended then the Bidder shall have to renew Performance Security for a period of extended tenure.

If the Successful Bidder, fails to furnish the Performance Security, it shall be lawful for GMDC to forfeit the EMD and cancel the Contract or any part thereof.

GMDC shall be entitled to forfeit and appropriate the amount of the Performance Security in whole or in part:

1. in the event GMDC requires to recover any sum due and payable to it by the Bidder including but not limited to damages; and which the Bidder has failed to pay in relation thereof; and
2. in relation to Bidder's breach in accordance with the terms contained in the Agreement

At any time during the Validity Period, the Performance Security has either been partially or completely been encashed by GMDC in accordance with the provision of the Agreement, the Bidder shall within 15 (fifteen) days of such encashment either replenish, or provide a fresh Performance Security, as the case may be, failing which GMDC shall be entitled to terminate the Agreement.

At the end of the tenure of the Contract, the Performance Security shall be returned to the Bidder without any interest, subject to any deductions which may be made by GMDC in respect of any outstanding dues under the terms of the Agreement.

7.4. Proprietary data

Subject to the provisions of Section 6.9, all documents and other information provided by GMDC or submitted by Bidder to GMDC shall remain or become the property of GMDC. Bidder is to treat all information as strictly confidential. GMDC will not return any Bid, or any information related thereto. All information collected, analyzed, processed or in whatever manner provided by the Bidder to GMDC in relation to the assignment pursuant to the scope of work / terms of reference shall be the property of GMDC.

7.5. Tax liability

The rates quoted in Price Bid Annexure 14 shall be inclusive of all taxes, duties, surcharge Levies etc. as applicable except applicable Goods and Service Tax. Applicable GST at the time of invoicing shall be reimbursed by GMDC.

GMDC shall be entitled to deduct tax at source as may be applicable. The TDS certificate(s) shall be submitted as per the due date specified in the Income Tax Act.

8. Fraudulent and corrupt practices

The Bidders and their respective officers, employees, agents, and advisers shall observe the highest standard of ethics during the Bidding process and subsequent to the issue of the LOA and during the subsistence of the Contract. Notwithstanding anything to the contrary contained herein, or in the LOA or the Contract, GMDC may reject a Bid, withdraw the LOA, or terminate the Contract, without being liable in any manner whatsoever to the Bidder, if it determines that the Bidder or as the case may be, has, directly or indirectly or through an agent, engaged in corrupt practice, fraudulent practice, coercive practice, undesirable practice, or restrictive practice in the Bidding process. In such an event, GMDC shall be entitled to forfeit and appropriate the EMD, as the case may be, without prejudice to any other right or remedy that may be available to GMDC under the Bidding documents and/ or the Contract, or otherwise. In case of cancellation of Contract, if already awarded, GMDC shall be entitled to recover from the Bidder the amount of any loss arising from such cancellation in accordance with provisions of RFP document.

Without prejudice to the rights of GMDC hereinabove and the rights and remedies which GMDC may have under the LOA or the Contract or otherwise if a Bidder as the case may be, is found by GMDC to have directly or indirectly or through an agent, engaged or indulged in any corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice during the Bidding process, or after the issue of the LOA or the execution of the Contract and/or otherwise, such Bidder shall not be eligible to participate in any RFP or RFP issued by GMDC during a period of 2 (two) years from the date of identification of such practice.

For the purposes of this Section 8, the following terms shall have the meaning hereinafter respectively assigned to them:

1. "**Corrupt practice**" shall mean (i) the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the actions of any person connected with the Bidding process (for avoidance of doubt, offering of employment to or employing or engaging in any manner whatsoever, directly or indirectly, any official of GMDC who is or has been associated in any manner, directly or indirectly, with the Bidding process or the LOA or has dealt with matters concerning the Contract or arising there from, before or after the execution thereof, at any time prior to the expiry of one year from the date such official resigns or retires from or otherwise ceases to be in the service of GMDC, shall be deemed to constitute influencing the actions of a person connected with the Bidding process); or (ii) engaging in any manner whatsoever, whether during the Bidding process or after the issue of the LOA or after the execution of the Contract, any person in respect of any matter relating to the LOA or the Contract or otherwise, who at any time has been or is a legal, financial or technical adviser of GMDC in relation to any matter concerning the assignment
2. "**Fraudulent practice**" shall mean a misrepresentation or omission of facts or suppression of facts or disclosure of incomplete facts, in order to influence the Bidding process
3. "**Coercive practice**" shall mean impairing or harming, or threatening to impair or harm, directly or indirectly, any person or property to influence any person's participation or action in the Bidding process
4. "**Undesirable practice**" shall mean (i) establishing contact with any person connected with or employed or engaged by GMDC with the objective of canvassing, lobbying or in any manner influencing or attempting to influence the Bidding process; or (ii) having a Conflict of Interest as per Section 9
5. "**Restrictive practice**" shall mean forming a cartel or arriving at any understanding or arrangement among Bidders with the objective of restricting or manipulating a full and fair competition in the Bidding process

9. Conflict of interest

The Bidder shall not have a conflict of interest that may affect the selection process. Any Bidder found to have a conflict of interest shall be disqualified. In the event of disqualification, GMDC shall forfeit and appropriate the Bid Security, if available, or as mutually agreed genuine pre-estimated compensation and damages payable to GMDC for, inter alia, the time, cost, and effort of GMDC including consideration of such Bid, without

prejudice to any other right or remedy that may be available to GMDC hereunder or otherwise.

GMDC requires that the appointed Bidder provide professional, objective, and impartial advice and at all times hold GMDC's interests paramount, avoid conflicts with other assignments or its own interests, and act without any consideration for future work. The Bidder shall not accept or engage in any assignment that would be in conflict with its prior or current obligations to other clients, or that may place it in a position of not being able to carry out the assignment in the best interests of GMDC.

Without limiting the generality of the above, shall be deemed to have a conflict of interest affecting the selection process, if the relationship between two Bidders is established through common holding, either directly or through associates, of at least 26% holding of equity/profit sharing in another company/firm, or in each other and other terms as specified hereunder:

1. The Bidder, its member or associate (or any constituent thereof) and any other Bidder, its member or associate (or any constituent thereof) have common controlling Ownership interest. Common controlling Ownership interest for Company, Limited Liability Partnership Firm is defined as follows. Associates of the Bidding firm shall mean parent and/or subsidiary and/or sister concerned firm having meaning specified in definition Section:
    a. **If Bidder is a Company**: In such case, the Bidder (including its associate or any shareholder thereof of Bidder and/or its associates) possessing over 26% of the paid up and subscribed capital in its own company or associate as the case may be, also holds:
        i. more than 26% of the paid up and subscribed equity capital in the other Bidder, its member or associate of such other Bidder or associates is company and/or
        ii. More than 26% of profit sharing in other Bidder or associates such other Bidder or associates is a Limited Liability Partnership firm and/or
    b. **If Bidder is a Limited Liability Partnership Firm:** In such case, the Bidder or its partners or associate having a profit sharing of more than 26% of such Bidder or its partners or associate as the case may be also holds:
        i. more than 26% of the paid up and subscribed equity capital in the other Bidder or associate of such other Bidder, its member or associates is company and/or
        ii. more than 26% of profit sharing in other Bidder or its associates such other Bidder or its associates is a Limited Liability Partnership firm and/or
2. A constituent of such Bidders is also a constituent of another Bidders, or
3. Such Bidders receive or has received any direct or indirect subsidy or grant from any other Bidder/s, or has provided any such subsidy to any other Bidders, or
4. Such Bidder has the same legal representative for purposes of this Bid as any other Bidders or
5. such Bidders have a relationship with another Bidders, directly or through common third Parties, that puts them in a position to have access to each other's' information about, or to influence the Bid of either or each of the other Bidders or

6. there is a conflict among this and other assignments of the Bidder (including its personnel and other members, if any) and any subsidiaries or entities controlled by such Bidder or having common controlling shareholders. The duties of the Bidder will depend on the circumstances of each case. While providing services to GMDC for this assignment, the Bidder shall not take up any assignment that by its nature will result in conflict with the present assignment
7. The Bidder shall furnish an affirmative statement as to the existence of, or potential for conflict of interest on the part of the Bidder due to prior, current Contracts, engagements, or affiliations with GMDC. Additionally, such disclosure shall address any and all potential elements (time frame for service delivery, resource, financial or other) that would adversely impact the ability of the Bidder to complete the requirements as given in the RFP

Part 4: Annexures

List of annexures:

Annexure No.	Description
Annexure 1	Boiler and ESP Technical Specifications
Annexure 2	Spares for Boiler Overhaul
Annexure 3	Spares for ESP retrofitting
Annexure 4	List of Hangers
Annexure 5	Letter of bid submission
Annexure 6	Bidders experience and credentials
Annexure 7	Declaration of key personnel
Annexure 8	Revenue and net worth statement
Annexure 9	No blacklisting certificate
Annexure 10	No deviation certificate
Annexure 11	Format for power of attorney
Annexure 12	Undertaking regarding geniuses of documents
Annexure 13	Undertaking of indemnity
Annexure 14	Indicative format of Price bid
Annexure 15	Format for Bank Guarantee towards EMD
Annexure 16	Format for Bank Guarantee towards Performance Security
Annexure 17	List of approved banks for EMD, RFP fees, and Performance Security

Annexure 1: Boiler and ESP Technical Specifications

Boiler (General description)

S.no.	Description			
1.1.0	**GENERAL**		At percentage of Steam Generator MCR of 405 TPH 100%	92%
1.1.01	a) Boiler drum working pressure	[kg/cm^2(abs)]	152	149.6
	b) Boiler drum design pressure	[kg/cm^2(abs)]	163.2	
1.1.02	Steam flow at final superheater outlet	(Kg/hr)	405,000	369,600
1.1.03	Steam pressure at final superheater outlet	[kg/cm^2(g)]	140.1	138.8
1.1.04	Steam temperature at final superheater outlet	(Deg.C)	538	538
1.1.05	Reheater steam flow	(Kg/hr)	377,680	343,980
1.1.06	Steam temperature reheater outlet	(Deg.C)	537	537
1.1.07	Steam temperature at reheater inlet	(Deg.C)	355	345.3
1.1.08	Pressure drop Across reheater	(bar)	1.84	1.64
1.1.09	Pressure drop in CRH line	(bar)	1.0	0.94
1.1.10	Pressure drop in HRH line	(bar)	1.0	0.94
1.1.11	Feedwater temperature at economiser inlet	(Deg.C)	246.8	241.5
1.1.12	Heat liberated by fuel			
	a) Max. net heat input per plan area of surface	(Kcal/m^2/hr)	125,591	115,574
	b) Max. heat liberation rate	(Volumetric loading in Kcal/m^3/hr)	99,200	91,289
	c) Max. burner zone heat release rate	(Kcal/m^2/hr)	Later	
1.1.13	Furnace cooling factor	(Kcal/hr/m^2)	Successful bidder to refer to relevant OEM drawings/manuals	
1.1.14	Steam purity at SH outlet [As per VGB Guidelines]:			
	a) Total dissolved solids	(ppm)	<0.1	
	b) Silica	ppm as $Si0_2$	<0.02	
	c) Sodium	ppm as Na	< 0.01	
	d) Copper	ppm as Cu	<0.003	

S.no.	Description		
	e) Iron	ppm as Fe	<0.02
1.1.15	Furnace exit gas temperature	(Deg.C)	865 857
1.1.16	Weight of fuel (worst lignite) fired	(kg/hr)	183000 .....
1.1.17	a) Design Lignite	(kg/hr)	103050 95015
	b) Worst Lignite	(kg/hr)	182358 168120
1.1.18	Maximum continuous steam output with one ID fan, one PA and one SA fan out of operation	(t/h)	243 .....
1.1.19	**Temperature**:	**(Deg.C)**	100% 92%
1.1.2	**Air**		
1.1.21	Design ambient		36 36
1.1.22	Inlet to the air heaters (Primary Air)		46 46
1.1.23	Outlet of the Air heaters (Primary Air)		247 246
1.1.24	Inlet to the air heater (Secondary air)		46 46
1.1.25	Outlet of the air heater (Secondary air)		247 246
1.1.26	Secondary Air at inlet to burners		247 246
1.1.3	**Flue Gases**:		100% 92%
1.1.31	a) Theoretical combustion temp. in the combustion zone		865 857
	b) Max. furnace exit gas temp.		865 857
1.1.32	At furnace exit		865 857
1.1.33	Entrance to cyclones		865 857
1.1.34	Entrance to superheater:		
	Stage-I SH5		807 796
	Stage-II SH3		708 696
	Stage-III RH1		565 555
1.1.35	Exit of superheater:		
	Stage-I		Successful bidder to refer to relevant OEM drawings/manuals
	Stage-II		Successful bidder to refer to relevant OEM drawings/manuals
1.1.36	Entrance to Reheater:		

S.no.	Description		
	Stage-I		Successful bidder to refer to relevant OEM drawings/manuals
	Stage-II		Successful bidder to refer to relevant OEM drawings/manuals
1.1.37	Exit of Reheater:		
	Stage-I		Successful bidder to refer to relevant OEM drawings/manuals
	Stage-II		Successful bidder to refer to relevant OEM drawings/manuals
1.1.38	Entrance to Economiser		428 421
1.1.39	Exit of Economiser		272 269
1.1.310	Entrance to Air heater		272 269
1.1.311	Exit of Air heater		136 135
1.1.312	Entrance to Electrostatic Precipitator		136 135
1.1.313	Entrance to ID Fans		134 133
1.1.314	Entrance to Chimney		136 135
1.1.315	Margin above acid dew point		Successful bidder to refer to relevant OEM drawings/manuals
1.1.4	**Feed Water**:		100% 92%
1.1.41	Water entering Economiser		242 242
1.1.42	Water leaving Economiser		304 303
1.1.43	Spray water temperature	(°C)	
	a) Superheater		242 242
	b) Reheater		175 175
1.1.5	**Steam**:		100% 92%
1.1.51	Inlet to Superheater	(°C)	
	Stage-I SH:1 SH-2		339 336 342 339
	Stage-II SH:3 SH-4		357 357 400 399
	Stage-III SH:5		469 468

S.no.	Description		
	Indicate regime of Stage-I attemperation		425/400 428/399
1.1.52	Outlet of Superheater	(°C)	
	Stage-I SH:1 SH:2		342 339 357 357
	Stage-II SH:3 SH:4		425 428 494 497
	Stage-III SH:5		540 540
	Indicate regime of attemperation Stg.2		494/469 497/468
1.1.53	Inlet to Reheater	(°C)	
	Stage-I RH-1		340 340
	Stage-II RH-2		442 443
	Indicate regime of attemperation		464/442 457/443
1.1.54	Outlet of Reheater	(°C)	
	Stage-I RH-1		464 457
	Stage-II RH-2		540 540
1.2.0	**PRESSURES**		
1.2.1	**Air (mm w.c.)**		100% 92%
1.2.11	Secondary air fan discharge		1244 1195
1.2.12	Airheater inlet (secondary air)		1116 1089
1.2.13	Airheater outlet (secondary air)		933 931
1.2.14	In burner (Secondary air)		836 803
1.2.15	Primary air fan discharge		1967 1922
1.2.16	Airheater inlet (primary air)		1850 1823
1.2.17	Airheater outlet (primary air)		1667 1665
1.2.18	Cyclones		Successful bidder to refer to relevant OEM drawings/manuals
1.2.19	Any other equipment thru gas path		NS NS
1.2.2	**Feed Water (Kg/cm^2), abs**		100% 92%
1.2.21	Feed pump discharge		Successful bidder to refer to relevant OEM drawings/manuals
1.2.22	Feed regulating station inlet		Successful bidder to refer to relevant OEM

S.no.	Description		
			drawings/manuals
1.2.23	Feed regulating station outlet - Design pressure - Design temperature	 (bar) (°C)	 240 250
1.2.24	Inlet to Economiser		148.1 141.7
1.2.25	Outlet of Economiser		146.5 140.2
1.2.3	**Steam ($kg/cm^{2)}$abs**		
1.2.31	Inlet to Superheater:		
	Stage-I SH-1 SH-2		144.5 138.3 142.8 136.8
	Stage-II SH-3 SH-3		141.5 135.7 140.0 134.4
	Stage-III SH-5		136.7 131.4
1.2.32	Outlet of Superheater:		
	Stage-I SH-1 SH-2		142.8 136.8 142.1 136.2
	Stage-II SH-3 SH-4		140.8 135.1 137.5 132.1
	Stage-III SH-5		135 130
1.2.33	Inlet to Reheater:		
	Stage-I RH-1		35.6 35.1
	Stage-II RH-2		34.8 34.4
1.2.34	Outlet to Reheater:		
	Stage-I RH-1		35.3 34.8
	Stage-II RH-2		33.7 33.4
1.3.0	**PRESSURE DROPS**		100% 92%
1.3.1	**Air Path (mm w.c.)**		
1.3.11	Primary Air Circuit:		
	a) In air ducts including bends, dampers, vanes, etc.		866 841
	b) TAPH		183 158
	c) Across aero foil (flow measuring device)		25 22
	d) Total loss through the system		1074 1021
1.3.12	Secondary Air Circuit:		

S.no.	Description			
	a) In air ducts including bends, dampers, vanes, etc.		469	437
	b) TAPH		183	158
	c) Across aero foil (flow measuring device)		25	21
	d) Total loss through the system		678	616
1.3.2	**Fuel Gas Path (mm w.c.):**			
1.3.21	Across Superheaters		13.6	
1.3.22	Across Reheater		12.9	
1.3.23	Across Economisers		21.0	
1.3.24	Across Air heater		107.5	
1.3.25	Across any other equipment such as cyclones etc.		14.7 (gas duct)	
1.3.26	In gas ducts:			
	a) Between Airheater outlet and Electrostatic Precipitator inlet		8.2	
	b) Between EP inlet cone and EP outlet cone		25.0	
	c) Between Outlet cone of EP and inlet of ID fan		45.8	
	d) Outlet ID fan &inlet stack		51.0	
1.3.27	Total loss through the system		305.3	
1.3.3	**Velocities (m/sec.)**		100%	92%
1.3.31	Max. gas velocity through tube gaps of			
	a) Superheater			
	Stage-I SH-5		7.1	6.5
	Stage-II SH-3		9.0	8.2
	Stage-III		Successful bidder to refer to relevant OEM drawings / manuals	
	b) Reheater			
	Stage-I RH-1		7.7	7.0
	Stage-II		Successful bidder to refer to relevant OEM drawings / manuals	
	c) Economiser		5.8	5.2

S.no.	Description			
	d) Tubular Air Preheater		7.6	7.0
1.3.32	Max. gas velocity in flue ducts		10	9.1
1.3.33	Max. air velocity in ducts		12-25	
1.3.34	Max. gas velocity at cyclone inlet and outlet		20/32	18/29
1.4.0	**Percentage of Oxygen in flue gases**		100%	92%
1.4.1	Air Furnace exit		3.57	3.57
1.4.2	At cyclone exit		3.57	3.57
1.4.3	At Economiser outlet		3.57	3.57
1.4.4	At Airheater outlet		3.57	3.57
1.5.0	**Flow Rate of Air**	**(kg/hr)**	100%	92%
1.5.1	FD fan outlet		503507 (Primary & Secondary fan outlet)	463187
1.5.2	Airheater inlet:			
	a) Primary		232632	214488
	b) Secondary		258275	236100
1.5.3	Airheater outlet:			
	a) Primary		232632	214488
	b) Secondary		258275	236100
1.5.4	Total combustion air		516960	476640
1.6.0	**Excess Air (%):**		100%	92%
	a) Burner (Furnace)		20	20
	b) At Furnace exit		20	20
	c) At Economiser exit		20	20
	d) At the Airheater exit		20	20
	e) At ID fan inlet		20	20
1.6.1	Max. gas flow at furnace throat with 20 percent excess air at Economiser inlet		Successful bidder to refer to relevant OEM drawings / manuals	
1.7.0	**Leakage**		100%	92%
	a) Primary Air			
1.7.1	Steam coil air preheater		Successful bidder to refer to relevant OEM drawings /	

S.no.	Description			
			manuals	
1.7.2	Tubular Air Preheater		Successful bidder to refer to relevant OEM drawings / manuals	
1.7.3	Ducts/Dampers:		Successful bidder to refer to relevant OEM drawings / manuals	
	b) Secondary Air		Successful bidder to refer to relevant OEM drawings / manuals	
1.7.4	Tubular Airheater		Successful bidder to refer to relevant OEM drawings / manuals	
1.8.0	**Heat Balance** (based on HHV of lignite fired)		100% 92%	
1.8.1	Total lignite fired (tonnes/hr)		103050	95015
1.8.2	a) High heating value (Gross) of lignite	(Kcal/Kg.)	3200	
	b) Low heating value of lignite	(Kcal/Kg.)	2883	
1.8.3	Heat absorbed per kg of fuel in			
	a) Air Preheater	(Kcal)	227.9	224.7
	b) Economiser	(Kcal)	271.9	263.1
	c) Superheaters	(Kcal)	867.4	872.0
	d) Reheaters	(Kcal)	422.8	420.3
	e) Water walls	(Kcal)	1103.7	1110.3
	f) Total heat absorbed by the Unit	(Kcal)	2893.7	2890.4
1.8.4	Heat losses in the Steam Generator (on HHV of Fuel):			
	a) Heat loss in flue gas	(%)	14.642	14.595
	i) Dry gas loss		3.921	3.508
	ii) Hydrogen in the fuel		3.757	3.745
	iii) Moisture in the fuel		6.811	6.789
	iv) Moisture in the air		0.153	0.153
	b) Heat loss due to unburnt carbon	(%)	0.543	0.542
	c) Heat loss due to radiation	(%)	0.427	0.470
	d) Unaccounted heat loss	(%)	1.251	1.248
	e) Manufacturer's margin		0.0	0.0

S.no.	Description		
	f) i) Efficiency at 100% BMCR		83.137
	ii) Efficiency at 92% BMCR		83.145
	iii) Efficiency at 75% BMCR		Successful bidder to refer to relevant OEM drawings/manuals
1.9.0	**Weight and Distribution of Ash Collected**	(tons/hr)	At 100% BMCR
1.9.1	Furnace bottom hopper		15.1
1.9.2	Economiser hopper		1.9
1.9.3	Airheater hoppers		1.2
1.9.4	**ESP hoppers**		**45.1**
1.10.0	**Ash Data**		Bed Ash / Cyclone Ash / AH hopper Ash / ESP Filter Ash <----- All at 100% BMCR ------>
1.10.1	No. of discharge pipes/hoppers		2+1 - 1 28
1.10.2	Pipe dia/hopper size		<---------- Not Stated --------->
1.10.3	System capacity - each (TPH)		14 - 1 49
1.10.4	System design capacity - each (TPH)		75 - 2 122
1.10.5	Discharge temp Deg.C at TP		260 - 135 135
1.10.6	Particle size (max.) - mm		15 - 1 1
1.11.0	**Design Data for Dust Concentration (worst lignite)**		Before Cyclone / After Cyclone At 100% BMCR
1.11.1	Flue gas (N cum/sec)		151.5 151.5
1.11.2	Solid flow (Kg/sec.)		2000 30.3
1.11.3	Dust load (Kg/N cum)		13.2 0.2
1.12.0	**Cyclones**		
	a) Quantity (Number)		2
	b) Efficiency (%)		99
	c) Flue gas temp (Deg.C)		816 (worst lignite)
	d) Material:		
	- Casing		IS:2062
	- Internals		Successful bidder to refer to relevant OEM drawings / manuals
	- Lining		Fire and Insulating brick

S.no.	Description		
	- Refractory		Successful bidder to refer to relevant OEM drawings / manuals
	e) Plate thickness (mm)		10
	f) Castable refractory lining (mm)		450/400
	g) Accessories provided		Successful bidder to refer to relevant OEM drawings / manuals
	h) Size of overall dimensions	(m)	17
	I) Design parameters		Successful bidder to refer to relevant OEM drawings / manuals

Main steam generator and auxiliaries including HP piping and valves

S.no.	Description		
2.0.0	**MAIN STEAM GENERATOR AND AUXILIARIES INCLUDING HP PIPING AND VALVES**		
2.1.0	**Data Sheets**		
2.1.1	Main steam generator		
2.1.11	**General**		
2.1.111	Manufacturer		ALSTOM, Germany
2.1.112	Design code		TRD, DIN, IBR
2.1.113	Type of steam generator		Natural circulation
2.1.114	Type of superheater (drainable/non-drainable)		Drainable
2.1.115	Total auxiliary power consumption at 100% BMCR	(kW)	5438
2.1.116	Min. load at which steam generator can be operated continuously with complete flame stability (% BMCR) without any oil support for fuel oil characteristic as table		35% with design lignite
2.1.117	a) Total water content of steam generator for hydraulic test	(cum)	Approx. 180
	b) Total water content of Reheater	(cum)	Approx. 60
2.1.12	**Furnace**		
2.1.121	Type		Circ. fluid bed

S.no.	Description		
2.1.122	Combustion chamber volume	(cum)	3674
2.1.123	a) Furnace height (from top of hopper to roof)	(mm)	31000
	b) Depth of fuel & fluidizing material bed	(mm)	6000 (hoppers)
2.1.124	Furnace width	(mm)	12900
2.1.125	Furnace depth	(mm)	8025
2.1.126	Water walls	(sq.m)	
	a) Front wall b) Side walls [Evaporator wings] c) Rear wall d) Roof e) Total heating surface		378 498 198 378 103 1555
2.1.127	Furnace surface adjustment factors (if applicable) a) Front wall b) Side walls c) Rear wall d) Roof		Successful bidder to refer to relevant OEM drawings/manuals
2.1.128	Specification of tube material		SA-106 Gr.B/SA-210 Gr.
2.1.129	Design standard		IBR/ISO ASME material
2.1.1210	Outside diameter and thickness of tube	(mm)	57/5
2.1.1211	Margin on tube thickness over and above the pressure requirement		$\geq$ 1.0
2.1.1212	Design metal temperature	(Deg.C)	393
2.1.1213	Design pressure of tubes	(kg/sqcm)	155
2.1.1214	Furnace design pressure	(mmwc)	1020
2.1.1215	Total weight	(tonnes)	Successful bidder to refer to relevant OEM drawings/manuals
2.1.1216	Residence time of fuel particles in the furance		>6 sec. for particles <90 μm, upto several mins. for particles >90 μm
2.1.1217	Water wall header material specification		SA-106 Gr.C
2.1.1218	Design standard		IBR/ISO
2.1.1219	Outside diameter	(mm)	168
2.1.1220	Thickness	(mm)	30
2.1.1221	Design pressure	(kg/sq.cm)	153
2.1.1222	Approx total weight of headers		Successful bidder to refer to relevant OEM drawings/manuals

S.no.	Description		
2.1.1223	Maximum header unbalance		Successful bidder to refer to relevant OEM drawings/manuals
2.1.13	**Boiler Drum**		
2.1.131	Specification of material		SA-299
2.1.132	Elevation of drum	(m)	+51 M
2.1.133	Overall length	(mm)	13000
2.1.134	Outside diameter	(mm)	1620
2.1.135	Thickness of shell	(mm)	110
2.1.136	Ordered thickness of shell	(mm)	Successful bidder to refer to relevant OEM drawings/manuals
2.1.137	Design pressure	(kg/sq.cm)	157
2.1.138	Design metal temp	(Deg.C)	346
2.1.139	Permissible max temp differential between any parts of the drum during normal operation	(Deg.C)	Designed for 2000 cold starts according to TRD
2.1.1310	During accelerated starting		Successful bidder to refer to relevant OEM drawings/manuals
2.1.1311	Drum weight without internals	(tonnes)	Successful bidder to refer to relevant OEM drawings/manuals
2.1.1312	Drum weight with all internals	(tonnes)	61 approx.
2.1.1313	Water capacity at BMCR conditions (in seconds) between normal and lowest water level permitted	(seconds)	53
2.1.1314	Purity of saturated steam leaving the drum [As per VGB guidelines for feedwater]		
	a) Total dissolved solids	ppm	<0.1
	b) Silica content	ppm as SiO_2	<0.02
	c) Sodium	ppm as Na	<0.01
	d) Copper	ppm as Cu	<0.003
	e) Iron	ppm as Fe	<0.02
2.1.1315	0.2% proof stress of the material [As per VGB guidelines]		Successful bidder to refer to relevant OEM drawings/manuals
2.1.14	**Superheaters**		
2.1.141	Heating Surfaces		
	Superheater :		

S.no.	Description		
	a) Stage-I (sqm) b) Stage-II (sqm) c) Stage-III (sqm)		SH1:427;SH2:810 SH3:2330;SH4:508 SH5:1553
2.1.142	Number of stages		5
2.1.143	Specification of material		SA-210/SA-209/SA-213
2.1.144	Type of flow (counter or parallel)		SH4, RH2- Parallel SH3, SH5, RH1 -Counter
2.1.145	Outside diameter and thickness of tubes (mmxmm)		SH1:38x5.6 SH2:31.8x5 SH3:44.5x4/5/5.6 SH4:48.3x4.5/7.1 SH5:44.5x6.3/7.1/8
2.1.146	Margin on tube thickness over and above pressure requirement		0.6 mm (1.0mm for first row)
2.1.147	Max gas side metal temperature	(Deg.C)	0.6 mm (1.0mm for first row)
2.1.148	Number and type of thermocouples fitted to superheater tubes :		60 Nos. type-K thermocouples on SH tubes near headers
	a) In gas path		No thermocouples in gas path
	b) In penthouse		Successful bidder to refer to relevant OEM drawings/manuals
2.1.149	Approximate total weight (tonnes)		Successful bidder to refer to relevant OEM drawings/manuals
2.1.1410	Superheater headers :		
	a) Specification of material		SA106/SA213/ SA 335
	b) Design pressure (kg/sqcm)		157
	c) Approximate total weight (tonnes)		Successful bidder to refer to relevant OEM drawings/manuals
	d) Maximum headers unbalance		Successful bidder to refer to relevant OEM drawings/manuals
2.1.15	**Superheater attemperator**		
2.1.151	Type		Spray type
2.1.152	Number of stage of attemperation		2
2.1.153	Position in steam circuit		SH3-SH4/SH4-SH5
2.1.154	Specification of material		SA 335/SA 106B
2.1.155	Steam generator evaporation rates		Successful bidder to refer to relevant OEM drawings/manuals
2.1.156	Spray nozzle material		SA213

S.no.	Description		
2.1.157	Max spray water flow rate and corresponding steam output when firing design fuel	(kg/hr)	29450 405000
2.1.16	**Reheaters**		
2.1.161	Heating surfaces		Successful bidder to refer to relevant OEM drawings/manuals
2.1.161	Number of stages		2
2.1.162	Specification of material Type of flow (counter or parallel)		RH1 RH2 Counter Parallel SA-209 SA-213
2.1.163	Max gas side metal temperature outside and thickness of tubes	(Deg.C) (mmx mm)	544 594 44.5x4 51x5.6
2.1.164	Approximate total weight	(tonnes)	Successful bidder to refer to relevant OEM drawings/manuals
2.1.165	Reheater headers :		
	a) Specification of material		SA335 SA335
	b) Design pressure	(kg/sq.cm)	50 50
	c) Design metal temperature	(Deg.C)	520 550
	d) Approximate total weight	(tonnes)	Successful bidder to refer to relevant OEM drawings/manuals
2.1.166	Maximum header unbalance		Successful bidder to refer to relevant OEM drawings/manuals
2.1.17	**Reheater attemperator**		
2.1.171	Type		Spray type
2.1.172	Number of stages of attemperation		1
2.1.173	Position in the steam circuit		RH1-RH2
2.1.174	Specification of material		SA335
2.1.175	Max spray water flow rate and corresponding steam flow when firing design fuel	(T/hr)	6.880 360
2.1.176	Spray nozzle material		SA-210
2.1.18	**Economizer :**		
2.1.181	Specification of material		SA-210
2.1.182	Outside diameter and thickness	(mm x mm)	38x4
2.1.183	Max gas and side metal temp	(Deg.C)	Successful bidder to refer to relevant OEM drawings/manuals

S.no.	Description		
2.1.184	Size of extended metallic surface (if provided)	(mm x mm)	Successful bidder to refer to relevant OEM drawings/manuals
2.1.185	Approximate total weight	(tonnes)	Successful bidder to refer to relevant OEM drawings/manuals
2.1.186	Economizer headers		
	a) Specification of material		SA-210
	b) Design pressure c) Design metal temperature	(kg/sq.cm) (Deg.C)	160 360
2.1.187	Maximum header unbalance		Successful bidder to refer to relevant OEM drawings/manuals
2.1.19	**Boiler mounting & fittings :**		
2.1.191	Drum safety valves (for each safety valve)		
	a) Manufacturer		Yarway/Hopkinson/Crosby or Equiv.
	b) Type and rating		Spring loaded
	c) Number		Two (2)
	d) Specification of material		A-105
	e) Set pressure	(kg/sq.cm)	Successful bidder to refer to relevant OEM drawings/manuals
	f) Flow capacity	(t/hr)	Successful bidder to refer to relevant OEM drawings/manuals
	g) Blowdown	(%)	Successful bidder to refer to relevant OEM drawings/manuals
2.1.192	Superheater safety valves (for each safety valve)		
	a) Manufacturer		Yarway/Hopkinson/Eq.
	b) Type and rating		Spring Loaded
	c) Number		Two (2)
	d) Specification of material		Successful bidder to refer to relevant OEM drawings/manuals
	e) Set pressure	g/sq.cm)	Successful bidder to refer to relevant OEM drawings/manuals
	f) Flow capacity	(t/hr)	Successful bidder to refer to relevant OEM drawings/manuals

S.no.	Description		
	g) Blowdown	(%)	Successful bidder to refer to relevant OEM drawings/manuals
2.1.193	Reheat safety valve (for each safety valve)		
	a) Manufacturer		Yarway/Hopkinson/Eq.
	b) Type and rating		Spring Loaded
	c) Number		Two (2)
	d) Set pressure	(kg/cm^2 abs)	Successful bidder to refer to relevant OEM drawings/manuals
	e) Flow capacity	(t/hr)	Successful bidder to refer to relevant OEM drawings/manuals
	f) Specification of material		Successful bidder to refer to relevant OEM drawings/manuals
	g) Blowdown	(%)	Successful bidder to refer to relevant OEM drawings/manuals
2.1.194	Electromatic safety valves on superheater outlet		
	a) Manufacturer		Yarway/Hopkinson/Eq.
	b) Type of actuator		Solenoid
	c) Number		One (1)
	d) Capacity of valve	(t/hr)	Successful bidder to refer to relevant OEM drawings/manuals
	e) Set pressure	(kg/cm^2,abs)	Successful bidder to refer to relevant OEM drawings/manuals
	f) Specification of material		Successful bidder to refer to relevant OEM drawings/manuals
2.1.195	Drum level gauges :		
	a) Manufacturer		Yarway/Hopkinson/Eq.
	b) Type		Local Bicolour water gauge hydrastep
	c) Number		2/2
	d) Location		Local/Remote
	e) Size		Successful bidder to refer to relevant OEM drawings/manuals
2.1.196	Flow meters		Steam flow Feed water flow Supporting fuel flow

S.no.	Description		
	a) Service		Successful bidder to refer to relevant OEM drawings/manuals
	b) Pressure drop		Successful bidder to refer to relevant OEM drawings/manuals
	c) Material		Successful bidder to refer to relevant OEM drawings/manuals
	d) Nozzle/orifice plate		Successful bidder to refer to relevant OEM drawings/manuals
	e) Max flow (kg/hr)		Successful bidder to refer to relevant OEM drawings/manuals

Steam Generator Auxiliaries

S.no.	Description		
3.0.0	**STEAM GENERATOR AUXILIARIES**		Air heater
3.1.1	Manufacturer		ABB-ABL
3.1.2	Type		Tubular
3.1.3	Number of air heaters per boiler		1 (primary + secondary)
3.1.4	Max flue gas temp corresponding ait outlet temp.	(Deg.C)	273/246
3.1.5	Max air leakage	(%)	Nil
3.1.6	Diameter of tubes	(mm)	60.3
3.1.7	Thickness of tubes	(mm)	2.3
3.1.8	Length of tubes	(mm)	12000
3.1.9	Number of tubes		4992
3.1.10	a) Material specified tubes including those at cold end		Carbon steel
	b) Number of blocks		3 primary + 3 secondary
	c) Medium inside tubes		Air
	d) Medium outside tubes		Fluegas
3.1.11	List accessories provided on air heater		Successful bidder to refer to relevant OEM drawings/manuals
3.1.12	Total effective heating surface in contact with the inlet air (Sq.M)		
	a) Secondary air side		17000
	b) Primary air side		17000

S.no.	Description		
	c) Gas flow area	(sq.m)	Successful bidder to refer to relevant OEM drawings/manuals
	d) Air flow area	(sq.m)	Successful bidder to refer to relevant OEM drawings/manuals
3.2.0	**Steam coil air heaters**		
3.2.1	Air inlet temp	(Deg.C)	0/1 (MCR)
			PA Design/ MCR SA Design/ MCR
3.2.2	Air outlet temp	(Deg.C)	100/38 100/38
3.2.3	Air flow rate	(Nm^3/hr)	19.12/31.9 23.37/38.95
3.2.4	Max steam flow rate required	(kg/hr)	3600/2200 4400/2700
3.2.5	Design steam pressure	(kg/sq.cm)	16
3.2.6	Design steam temp	(Deg.C)	Saturated
3.2.7	Specification of material		Tube - SA179 Fin - Aluminium
3.3.0	**Draft plant**		Secondary air fans/ Primary air fans/ Induced draft fans/ HP fludizing air blowers/ Limestone transport blowers
3.3.1	Manufacturer		AY/ABB/TLT
3.3.2	Type		Radial centrifugal
			SA PA ID Ash cooler
3.3.4	a) Volume flow rate	(m^3/sec)	35.69 30.51 104.10 1.163
	b) Volume flow rate	(m^3/sec)	48.53 41.34 146.95 1.51
3.3.5	Total pressure: - At 100% MCR - At design point - Variable present at 100% BMCR	(mmwc)	 1305 1995 299 1955 1627 2504 464 2190 677 1074 - 799
3.3.6	Margins included in		
	a) Flow rate	(%)	25 25 31 31
	b) Total pressure (%)		44 44 30 30
3.3.7	Fan efficiency at rated capacity		Successful bidder to refer to relevant OEM drawings/manuals
3.3.8	Starting torque	(kg.M)	Successful bidder to refer to relevant OEM drawings/manuals
3.3.9	Direction of rotation facing fan		Successful bidder to refer to

S.no.	Description		
	coupling (clock wise or counter clock wise)		relevant OEM drawings/manuals
3.3.10	Size of motor	(KW)	1010 1380 1030 70
3.3.11	Total weight of fan and motor	(tonnes)	Successful bidder to refer to relevant OEM drawings/manuals
3.3.12	Moment of inertia of shaft and impeller	(kg m^2)	Successful bidder to refer to relevant OEM drawings/manuals
3.3.13	Method of flow control		Inlet rane/DDC VSH coupling/ damper
3.3.14	Range of control		To suit
3.3.15	Rated speed of fan		1480 1480 740 2980
3.3.16	Type of coupling		Flexible bibby
3.3.17	Thickness and material of:		
	a) Casing		Successful bidder to refer to relevant OEM drawings/manuals
	b) Casing side plates		Successful bidder to refer to relevant OEM drawings/manuals
	c) Casing liner, if any		Successful bidder to refer to relevant OEM drawings/manuals
	d) Fan inlet vanes		Successful bidder to refer to relevant OEM drawings/manuals
	e) Impeller wear plate, if any		Successful bidder to refer to relevant OEM drawings/manuals
3.3.18	Diameter of impeller at blade tip		Successful bidder to refer to relevant OEM drawings/manuals
3.3.19	Shaft material		Successful bidder to refer to relevant OEM drawings/manuals
3.3.20	Shaft critical speeds	(rpm)	Successful bidder to refer to relevant OEM drawings/manuals
3.3.21	Design tip speed of blades	(m/sec)	Successful bidder to refer to relevant OEM drawings/manuals
3.3.22	Bearing and lubrication :		
	a) Type of bearing		<---Sleeve-->A Antifriction
	b) Method of lubrication		<----Forced----> Grease
	c) Number and capacity of lub oil pump (if applicable)		<----2x100%----> NA
	d) Number and capacity of oil cooler (if applicable)		<------2x100%--> NA

S.no.	Description		
3.3.23	Method of cooling and bearings (if not forced lubricated)		Successful bidder to refer to relevant OEM drawings/manuals
3.3.24	Electrostatic Precipitator (ESP) [Data furnished below is for one ESP]		2 stream ESP
3.3.241	**General**		
3.3.2411	Manufacturer		ABB or equivalent
3.3.2412	Manufacturer model number		FAA7x30H-96150
3.3.2413	a) Number of electrical field in series in direction of flow		6+1
	b) Number of passes		2
3.3.2414	Treatment time	(sec.)	25 (performance lignite) 21.4 (worst lignite)
3.3.2415	Specific collecting plate area	(sq.m/cu.m /sec)	148.74 for 7 fields 127.49 for 6 fields
3.3.2416	Number bus section per field		1
3.3.2417	Average bus voltage	(kV)	43
3.3.2418	Max gas velocity	(m/sec)	0.9412
3.3.242	**Predicted performance at design condition**		
3.3.2421	Overall precipitation efficiency	(%)	Successful bidder to refer to relevant OEM drawings/manuals
3.3.2422	Precipitator efficiency when any one field is out of service	(%)	99.927 (6 out of 7)
3.3.2423	Pressure drop across the precipitator/ bag filter	(mmwc)	20
3.3.2424	Gas temp drop across precipitator/bag filter	(Deg.C)	5 to 7
3.3.2425	Total power consumption including carona	(kW)	207
3.3.2426	Dust emission at ESP/outlet - When firing worst lignite - When firing performance lignite	(mg/N cum)	 150 130
3.3.243	**Predicted performance with 10% increase in gas flow**		
3.3.2431	Overall precipitator efficiency (%)		Successful bidder to refer to relevant OEM drawings/manuals
3.3.2432	Precipitator/bag filter efficiency when		Successful bidder to refer to

S.no.	Description		
	any one field is out of service (%)		relevant OEM drawings/manuals
3.3.2433	Pressure drop across the precipitator/bag filter	(mmwc)	Successful bidder to refer to relevant OEM drawings/manuals
3.3.2434	Gas temp drop across precipitator/bag filter	(Deg.C)	Successful bidder to refer to relevant OEM drawings/manuals
3.3.2435	Total power consumption	(kW)	Successful bidder to refer to relevant OEM drawings/manuals
3.3.2436	Dust emission at EP outlet	(Mg/N Cum)	Successful bidder to refer to relevant OEM drawings/manuals
3.3.244	**Collecting electrodes**		
3.3.2441	Material		Cold rolled sheets
3.3.2442	Size of electrodes		
	a) Width	(mm)	750
	b) Height	(mm)	15000
	c) Thickness	(mm)	1.5
3.3.2443	Number of electrodes		
	a) Per field		132
	b) Per precipitator		924
3.3.2444	Total active collection of area (sqm)		17280 - 6 fields 20160 - 7 fields
3.3.245	**Discharge electrodes**		
3.3.2451	Material		SS/UHB 9042
3.3.2452	Number of electrodes		
	a) Per field		1152
	b) Per precipitator		8064
3.3.2453	Electrodes diameter size	(mm)	2.7
3.3.2454	Length of electrodes	(M)	
	a) Per field		5760
	b) Per precipitator		40320
3.3.2455	Tensioning arrangement		Self tensioned
3.3.2456	Type of suspension		By hook
3.3.246	**Rapping mechanism for collecting electrodes**		
3.3.2461	Type		Tumbling hammer

S.no.	Description		
3.3.2462	Number of rapping sets per precipitator		7
3.3.2463	Adjustable range of rapping frequency provided	(sec.)	0 to 60 raps/hr
3.3.2464	Rapper controller:		
	a) Type		Microprocessor based
	b) Method of frequency control		Field adjustment
	c) Method of intensity controls		Successful bidder to refer to relevant OEM drawings/manuals
3.3.247	**Rapping mechanism for discharge electrodes**		
3.3.2471	Type		Tumbling hammer
3.3.2472	Number of rapping sets per precipitator		7
3.3.2473	Adjustable range of rapping frequency provided		0 to 60 raps/hr
3.3.2474	Rapper controller		
	a) Type		Microprocessor based
	b) Method of frequency control		Field adjustment
	c) Method of intensity control		Successful bidder to refer to relevant OEM drawings/manuals
3.3.2475	Details of rapping mechanism provided for inlet and outlet perforated distribution plates		Driven by 0.37 kw geared motor
3.3.248	**High tension support insulation**		
3.3.2481	Type		Cylindrical
3.3.2482	Material		Porcelain
3.3.2483	Leakage distance	(mm)	370
3.3.2484	Minimum flash over	(kV)	110
3.3.2485	Method of preventing fouling of insulation by flue gas		Successful bidder to refer to relevant OEM drawings/manuals
3.3.249	**Transformer rectifier unit**		
3.3.2491	Manufacturer		AOL/Hind Rectifier
3.3.2492	KVA rating		Successful bidder to refer to relevant OEM drawings/manuals
3.3.2493	Number per precipitator		6+1
3.3.2494	Primary voltage	(V)	415

S.no.	Description		
3.3.2495	Peak DC voltage & current	(KV, mA)	70/1350
3.3.2496	Method of cooling		Oil - Air
3.3.2497	Class of insulation		A
3.3.2498	Temperature rise above ambient temperature	(Deg.C)	50
3.3.2499	Half or full wave rectification		Full wave
3.3.2410	Transformer rectifier control cubicles		Successful bidder to refer to relevant OEM drawings/manuals
3.3.24101	Number per precipitator		6+1
3.3.24102	Method of voltage control		SCR
3.3.24103	Adjustable range of spark rate controller		Provided
3.3.24104	Details of pulse system provided		Semi pulse
3.3.24105	Details of microprocessor based controls envisaged		Included
3.3.2411	**Gas distribution device**		
3.3.24111	Type and location		2 (Nos.) at inlet and one No. at outlet (2 mm thick)
3.3.24112	a) Materials		MS
	b) Perforation size & other particulars		85 mm ∅
3.3.24113	Method of cleaning provided		Tumbling hammer
3.3.2412	**Dust hopper**		
3.3.24121	Number per precipitator		14
3.3.24122	Hopper storage capacity	(hrs.)	8
3.3.24123	Hopper valley angle to horizontal degrees		60
3.3.24124	Hopper outlets for attaching of fly ash system		
	a) Type		Flanged
	b) Size	(mm)	400x400
	c) Height above ground floor level	(M)	3.25
3.3.24125	Hopper plates		
	a) Material		MS
	b) Thickness		7 mm

S.no.	Description		
3.3.24126	Ash collection rate	(kg/hr)	
	a) 1st row		75 to 80% of total ash will be collected in 1st field
	b) 2nd row		Successful bidder to refer to relevant OEM drawings/manuals
	c) 3rd row		Successful bidder to refer to relevant OEM drawings/manuals
	d) 4th row		Successful bidder to refer to relevant OEM drawings/manuals
3.3.24127	Level indicators		
	a) Make and type		RF
	b) Number per hopper		Two (high and low level)
	c) Number of annunciation points provided		Yes, as required
	d) Reference to technical leaflets		Enclosed
3.4.0	**Soot Blowers**		
3.4.1	Manufacturer of :		
	a) Blowers		ABB-ABL
	b) Control equipment		ABB-Yakogawa or eq.
3.4.2	Type		Motor operated retractable/fixed
3.4.3	Conditions of steam used for blowing :		Multi nozzle type, 1 No. nozzle per 150 mm (retractable fixed)
	a) Pressure	(kg/sqcm)	16
	b) Temperature	(Deg.C)	250
3.4.4	Source of steam		From auxiliary header
3.4.5	Total operating time per group		Successful bidder to refer to relevant OEM drawings/manuals
3.4.6	Number, voltage and capacity of power supply feeder to sootblower MCC		Successful bidder to refer to relevant OEM drawings/manuals
3.4.7	Furnace soot blowers :		
	a) Number of soot blowers		NA
	b) Blower head material		NA
	c) Length of travel (mm)		NA
3.4.8	Superheater soot blowers		

S.no.	Description		
	a) Number of soot blowers		3
	b) Blower head material		Cast steel with SS nozzles
	c) Length of travel	(mm)	To suit
3.4.9	Reheater soot blowers		
	a) Number of soot blowers		3
	b) Blower head material		Cast steel with SS nozzle
	c) Length of travel	(mm)	To suit
3.4.10	Economizer sootblowers :		
	a) Number of soot blowers		6
	b) Blower head material		Cast steel with SS nozzles
	c) Length of travel	(mm)	To suit
3.4.11	Air heater sootblowers (if any)		
	a) Number of soot blowers		9
	b) Blower head material		Cast steel with SS nozzles
	c) Length of travel	(mm)	To suit
3.4.12	Operating pressure	(kg/sqcm)	12
3.5.0	**Pressure reducing and desuperheating station**		
3.5.1	Pressure reducing valves		
	a) Manufacturer		Successful bidder to refer to relevant OEM drawings/manuals
	b) Number of valves		Successful bidder to refer to relevant OEM drawings/manuals
	c) Flow capacity of each valve	(t/hr)	Successful bidder to refer to relevant OEM drawings/manuals
	d) Type of valve		Successful bidder to refer to relevant OEM drawings/manuals
	e) Type of actuator		Successful bidder to refer to relevant OEM drawings/manuals
	f) Body and trim materials		Successful bidder to refer to relevant OEM drawings/manuals
	g) Body design		Successful bidder to refer to relevant OEM drawings/manuals
	i) Pressure	(kg/sq.cm)	Successful bidder to refer to relevant OEM drawings/manuals

S.no.	Description		
	ii) Temperature	(Deg.C)	Successful bidder to refer to relevant OEM drawings/manuals
3.5.2	Desuperheaters		Successful bidder to refer to relevant OEM drawings/manuals
	a) Manufacturer		Successful bidder to refer to relevant OEM drawings/manuals
	b) Type		Successful bidder to refer to relevant OEM drawings/manuals
	c) Flow capacity	(t/hr)	Successful bidder to refer to relevant OEM drawings/manuals
	d) Design temperature	(Deg.C)	Successful bidder to refer to relevant OEM drawings/manuals
	e) Desuperheating water		Successful bidder to refer to relevant OEM drawings/manuals
	i) Pressure	(kg/sq.cm)	Successful bidder to refer to relevant OEM drawings/manuals
	ii) Temperature	(Deg.C)	Successful bidder to refer to relevant OEM drawings/manuals
	iii) Quantity	(kg/hr)	Successful bidder to refer to relevant OEM drawings/manuals
3.6.0	**Blowdown vessels**		IBD tank Flash tank Scaph tank CBD tank
3.6.1	Design code		Not Stated
3.6.2	Specification of material		<--ASTM-A-516 Gr.70----->
3.6.3	Shell diameter	(mm)	2500 2500 2500 ...
3.6.4	Shell height	(mm)	Successful bidder to refer to relevant OEM drawings/manuals
3.6.5	Operating pressure	(kg/sqcm)	Successful bidder to refer to relevant OEM drawings/manuals
3.6.6	Design pressure	(kg/sqcm)	Successful bidder to refer to relevant OEM drawings/manuals
3.6.7	Operating temperature	(Deg.C)	Successful bidder to refer to relevant OEM drawings/manuals
3.6.8	Number off per Steam Generator		<---------- One each -------->
3.7.0	**Fuel preparation and firing system**		See external piping chapter
3.7.1	Lignite		
	a) Bunker shut-off gates		
	i) Type		Slide gate

S.no.	Description		
	ii) Motor rating		2x4 x 1.5 KW
	iii) Materials		MS/stainless steel
	b) Raw lignite feeders		
	i) Manufacturer		EVT
	ii) Type		Combined draglink-rubber conveyor
	iii) Max pulser allowable	(t/hr)	90
	iv) Method of output control		Mechanical control gear
	v) Speed pulser allowable VA burden		Successful bidder to refer to relevant OEM drawings/manuals
	vi) Type of drive		Helical gear
	c) Raw lignite weighter		
	i) Manufacturer		Schenk, Germany
	ii) Model number		Successful bidder to refer to relevant OEM drawings/manuals
	iii) Range of measurement	(t/hr)	1:9
3.7.2	Light-up fuel igniters		Gas - Electrical ignition burner
	a) Consumption	(m^3/hr)	8
	b) Reference to scheme		8.00033/000 50-003/0
	c) Number of valves, specialities etc. provided		2 valves with vent valve to atmosphere
	d) Type and make of HEA ignitors		Successful bidder to refer to relevant OEM drawings/manuals
3.7.3	Duplex feeders		
	a) Type and make		EVT - Drag link feeder
	b) Capacity	(tonnes/hr)	105
	c) Speed variation		Mechanical control gear
	d) Motor rating	(kW)	2x5.5
	e) Number and size of outlet		2
	f) Size of inlet		Successful bidder to refer to relevant OEM drawings/manuals
3.7.4	Duct works		
	a) Material		Stainless steel
	b) Size and thickness	(mm)	8

S.no.	Description		
	c) Lining material and thickness for straight portion		Successful bidder to refer to relevant OEM drawings/manuals
	d) Lining material and thickness for bends		Successful bidder to refer to relevant OEM drawings/manuals
	e) Total weight air + flue gas ducts		Successful bidder to refer to relevant OEM drawings/manuals
3.7.5	**Oil Firing System**		
3.7.5.1	Fuel		Heavy fuel oil
3.7.5.2	Net calorific value of heavy oil	(Mj/kg)	37.78
3.7.5.3	**Startup burners (Heavy Oil):**		
	a) Arrangement per each boiler		2 units each in the narrow walls; 3 units in one longitu-dinal wall of the furnace
	b) Number of burners in operation		8
	c) Atomizing system		Steam-atomizing system at 16 bar pressure 250°C temp
	d) Total fuel flow for all burners (45% boiler load)	(kg/s)	4078
	e) Control range per burner, referred to the max. fuel flow		1:4 (Max.)
	f) Oil pressure at burner - approx.	(bar)	16
	g) Atomizing steam flow (referred to max. burner capacity) - approx.	(%)	6
	h) Combustion air temperature	(°C)	240
3.7.5.4	**Flame monitoring for startup burners**		
	a) Type of construction		Self-checking UV flame monitors
	b) Number of control units		10
	c) Number of flame detectors		20
3.7.5.5	**Pump Station (45% boiler load)**		
3.7.5.5.1	Suction filter:		
	a) Arrangement for each boiler		Two-line system, one filter as standby unit
	b) Number of filters		2
	c) Type of construction		Shell-type strainer Duplex filter
	d) Oil flow	(tphr)	Approx. 20
	e) Filter heating		Electric

S.no.	Description		
	f) Overall dimensions	(mm)	Successful bidder to refer to relevant OEM drawings/manuals
	g) Weight	(kg)	Successful bidder to refer to relevant OEM drawings/manuals
3.7.5.5.2	Heavy Oil Service Pumpsets:		
	a) Arrangement for each boiler		Two-line system, one pump as standby unit
	b) Type and make		Screw pump, Delta make
	c) Required oil temperature at pump inlet	(°C)	80
	d) Number of pumps for each boiler		2
	e) Viscosity	(mm^2/s)	370
	f) Pressure at inlet	(barg)	1
	g) Pressure at outlet	(barg)	30
	h) Operating speed	(rpm)	1450
	i) Power requirement	(kW)	38
	j) Motor rating	(kW)	42
	k) Pump heating		Electric
	l) Overall dimensions	(mm)	Successful bidder to refer to relevant OEM drawings/manuals
	m) Weight	(kg)	Successful bidder to refer to relevant OEM drawings/manuals
3.7.5.6	**Heavy Oil Preheating Station (45% boiler load)**		
	a) Arrangement of oil preheater per each boiler		Two-line system, one preheater as a standby unit
	b) Number of oil preheaters per boiler		2
	c) Type of construction		Tube bundle, horizontal
	d) Heavy oil flow of each preheater	(kg/h)	14,700
	e) Oil heating-up temperature from/to	(°C)	50/130
	f) Heating steam	bar abs/°C	16/250
	g) Heating steam consumption	(kg/h)	approx. 1200
3.7.5.7	**Oil Drain System (for driain oil)**		
3.7.5.7.1	**Oil Drain Tanks:**		
	a) Number per each boiler		1

S.no.	Description			
	b) Type of oil tank construction		Cylindrical, horizontal	
	c) Capacity of tank	(m^3)	1	
	d) Tank dimensions; diameter x length	(mm)	1000 x 1400	
	e) Tank heating		Electric	
	f) Weight	(Kg.)	Successful bidder to refer to relevant OEM drawings/manuals	
3.7.5.7.2	**Tank Drain Pumpsets:**			
	a) Number per each boiler		1	
	b) Type of pump construction		Screw pump	
	c) Make		Delta	
	d) Operating speed	(rpm)	1450	
	e) Conveying pressure	(barg)	5	
	f) Conveying flow	(tphr)	Approx. 3	
	g) Power requirement	(kW)	Approx. 0.8	
	h) Motor rating	(kW)	1.1	
	i) Pump heating		Electric	
	j) Overall dimensions	(mm)	Successful bidder to refer to relevant OEM drawings/manuals	
	k) Weight	(Kg)	Successful bidder to refer to relevant OEM drawings/manuals	
3.7.5.8	**Electric Heating Cables**			
	a) Type		Self-regulating and power limiting type	
	b) Make		Raychem/Thermon/Equal	
	c) Process maintenance temperature	(°C)	Upto 80° to 130°C as applicable	
	d) Construction		14 AWG Nickel plated copper bus wires of semi-conductive heating matrix in cross-linked polyolefin insulation jacket with tinned copper braided	
	e) Ratings:			
	i) Maximum continuous exposure temp		Prior to heater	After heater
	- Power ON	(°C)	65	121
	- Power OFF	(°C)	85	191

S.no.	Description		
	ii) Min. installation temperature	(°C)	<---------- 51 ---------->
	iii) Min. bending radius	(mm)	<---------- 32 ---------->
	iv) T-rating		T6 (85°C) T-3 (20°C)
	f) Nominal heat output (watts/meter at 50°C) when connected to 240V AC		During detailed engg. stage
	g) Power output curves		Successful bidder to refer to relevant OEM drawings/manuals
	h) Circuit breaker sizing		Successful bidder to refer to relevant OEM drawings/manuals
	i) Accessories		Monitor wires; Power connectors; End of circuit termination kits; Junction boxes; control panels and other accessories.
3.8.0	**Chemical dosing pumps: (Phosphate Dosing)**		
	a) Manufacturer		V K Pump or eq.
	b) Type		Positive displacement
	c) Number		2x100%
	d) Rated capacity (at full stroke) at rated discharge pressure	(litres/hr)	60 approx.
	e) Rated discharge pressure	(kg/sq.cm)	150 approx.
	f) Efficiency	(%)	Successful bidder to refer to relevant OEM drawings/manuals
	g) Speed (strokes/min)		Successful bidder to refer to relevant OEM drawings/manuals
	h) Size of motor	(kW)	Successful bidder to refer to relevant OEM drawings/manuals

High Pressure Piping

S.no.	Description		
4.0.0	**HIGH PRESSURE PIPING**		
4.1.0	Main steam piping ODx thickness	(mmxmm)	219.1x35/114.3x20/60.3x10 /33.7x5.6
4.1.1	Design pressure	(bar)	140
4.1.2	Design temperature	(Deg.C)	540

S.no.	Description		
4.1.3	Friction factor		Successful bidder to refer to relevant OEM drawings/manuals
4.1.4	Steam velocity	(m/sec)	Successful bidder to refer to relevant OEM drawings/manuals
4.1.5	Pressure drop at boiler MCR	(kg/sqcm)	Successful bidder to refer to relevant OEM drawings/manuals
4.1.6	Temp drop at boiler MCR	(Deg.C)	Successful bidder to refer to relevant OEM drawings/manuals
4.1.7	Specification of material		ASTM-A-335-P91
4.2.0	**Hot reheat piping OD x thickness (mmxmm)**		406.4x17.5/60.3x4/33.7x2.6
4.2.1	Design temperature	(Deg.C)	540
4.2.2	Friction factor		Successful bidder to refer to relevant OEM drawings/manuals
4.2.3	Steam velocity	(m/sec)	Successful bidder to refer to relevant OEM drawings/manuals
4.2.4	Pressure drop at boiler MCR	(kg/cm2)	Successful bidder to refer to relevant OEM drawings/manuals
4.2.5	Temp drop at boiler MCR	(Deg.C)	Successful bidder to refer to relevant OEM drawings/manuals
4.2.6	Specification of material		ASTM-A-335-P22
4.3.0	**Cold reheat piping ODxthickness (mmxmm)**		508x14.2(AS)/508x10/ 355.6x8/168.3x4.5/60.3x2.9/33.7 x2.6 (CS)
4.3.1	Friction factor		Successful bidder to refer to relevant OEM drawings/manuals
4.3.2	Steam velocity	(m/sec)	Successful bidder to refer to relevant OEM drawings/manuals
4.3.3	Presssure drop at boiler MCR	(kg/sqcm)	Successful bidder to refer to relevant OEM drawings/manuals
4.3.4	Temp drop at boiler MCR	(Deg.C)	Successful bidder to refer to relevant OEM drawings/manuals
4.3.5	Specification of material		ASTM-A-335-P22 / ASTM-A-106 Gr.C
4.4.0	**High pressure feed water piping**		
4.4.1	Design pressure	(kg/sqcm)	240
4.4.2	Design temperature	(Deg.C)	230
4.4.3	Friction factor		Successful bidder to refer to

S.no.	Description		
			relevant OEM drawings/manuals
4.4.4	Feed water velocity	(m/sec)	Successful bidder to refer to relevant OEM drawings/manuals
4.4.5	Specification of material		ASTM-A-106-Gr.C

Thermal insulation

S.no.	Description		
5.0.0	**THERMAL INSULATION**		
5.1.0	Insulating material		Mattress/Pipe sections
5.1.1	Type of insulating material		Rockwool
5.1.2	Manufacturer's name		Lloyd Insulations or eq.
5.1.3	Maximum temp, the insulating material can withstand	(Deg.C)	650
5.1.4	Insulating material standard		IS 8183/eq.
5.1.5	Density of insulating material in	(kg/cum)	for < 400°C : 100 for > 400°C : 150
5.1.6	Thermal conductivity at mean temperature of	(w/m ^{o}C)	150 kg/m^3 100 kg/m^3
	a) 50 Deg.C		0.038 0.04
	b) 100 Deg.C		0.0433 0.044
	c) 150 Deg.C		0.0506 0.052
	d) 200 Deg.C		0.0595 0.062
	e) 250 Deg.C		0.0672 0.074
	f) 300 Deg.C		0.088 0.088
	g) 350 Deg.C		Successful bidder to refer to relevant OEM drawings/manuals
5.1.7	Resistance to micro-organism	(Yes/No)	Yes
5.1.8	In-combustibility	(Yes/No)	Yes
5.2.0	Supporting fuel firing equipment		

Locally Mounted Instruments

S.no.	Description		

S.no.	Description		
8.0.0	**LOCALLY MOUNTED INSTRUMENTS**		
8.1.0	**Pressure Indicators/differential pressure indicators (PI/DPI)**		
8.1.1	Make/model		H Guru/Oasis Inst./ J N Marshall
8.1.2	Type		Bourden (above 1 kg/cm^2) Bellow (below 1 Kg/cm^2)
8.1.3	Range		To suit
8.1.4	Accuracy/smallest division		$\pm$0.5% of span
8.1.5	Dial size	(mm)	150
8.1.6	Connection - process/instrument		1/2" NPT (F)
8.1.7	Material of bourdon tube/bellows movement & casing		Sensing element - AISI 316 SS Movement material-AISI304SS Casing - Die cast Al, Stove enamel/eq balck finish
8.1.8	Material of separating diaphragm (wherever applicable)		AISI 304 SS
8.1.9	Safety device (list)		Blowout disc. at the back
8.1.10	Detailed literature/drawing ref.		Successful bidder to refer to relevant OEM drawings/manuals
8.1.11	Accessories (service wise)		Syphon for steam/hot water diaphragm seals for corrosive/visco fluid
8.1.12	Enclosures		NEMA-4X
8.2.0	**Temperature indicators (TI)**		
8.2.1	Make/model		Industrial Inst./Gen Inst./ Pyroele.
8.2.2	Type		Mercury filled
8.2.3	Range		To suit
8.2.4	Accuracy		$\pm$0.5% of FSD
8.2.5	Material of thermowell capillary, bourdon tube, movement and casing		AISI 316 SS
8.2.6	Dial size	(mm)	150
8.2.7	Immersion length		Successful bidder to refer to relevant OEM drawings/manuals
8.2.8	Extension neck/capillary length		Successful bidder to refer to relevant OEM drawings/manuals
8.2.9	Response time		40 sec (approx)

S.no.	Description		
8.2.10	Connection - process/instrument		To suit thermowell
8.2.11	Detailed literature/drawing Ref.		Successful bidder to refer to relevant OEM drawings/manuals
8.2.12	Enclosures		NEMA-4X
8.3.0	**Flow Indicators (FI)**		
8.3.1	Make, Model		Switzer/equiv.
8.3.2	Type		Vane/paddle
8.3.3	Range		To suit
8.3.4	Scale detail/length		Successful bidder to refer to relevant OEM drawings/manuals
8.3.5	Material - Tube/Float/packing/orifice plate		SS
8.3.6	Accuracy		±2%
8.3.7	Repeatability		±3%
8.3.8	Overall dimensions		Successful bidder to refer to relevant OEM drawings/manuals
8.3.9	Connection		1/2" NPT
8.3.10	Accessories		Successful bidder to refer to relevant OEM drawings/manuals
8.3.11	Detailed literature/drawing ref.		Successful bidder to refer to relevant OEM drawings/manuals
8.3.12	Enclosures		IP 65
8.4.0	**Pressure Switches (PS)/Diff. Pressure Switches (DPS)**		
8.4.1	Make, model		Switzer/Indfoss/equiv
8.4.2	Type		Bellow/Bourden
8.4.3	Range		To suit
8.4.4	Accuracy and differential		±0.5% FSD/10% of span
8.4.5	Repeatability		± 0.5% of span
8.4.6	Type of contacts		SPDT
8.4.7	Number of contacts		2 Nos.
8.4.8	Contact rating		AC, 240 V, 5A/0.5 A, 220V DC
8.4.9	Operating temperature range low limit/high limit		To suit
8.4.10	Set point		

S.no.	Description		
	i) Internal/external		Internal
	ii) Factory set/field		As necessary
8.4.11	Differential - Fixed/adjustable		Adjustable
8.4.12	Enclosure class		NEMA 4X
8.4.13	Maximum over pressure		150%
8.4.14	Dimensions		Successful bidder to refer to relevant OEM drawings/manuals
8.4.15	Connection - Process/conduit/instrument		1/2" NPT
8.4.16	Detailed literature/drawing ref.		Successful bidder to refer to relevant OEM drawings/manuals
8.4.17	Material of bellows, bourdon tube, movement & protective diaphragm		AISI 316 SS
8.4.18	Accessories		Snubbers for pulsating fluid, syphon for steam/hot water
8.5.0	**Level Switches (LS)**		
8.5.1	Make, model		Lweson/equiv.
8.5.2	Type		External/cage float operated
8.5.3	ASA rating		$\pm$ 0.5% of span/10% of span
8.5.4	Accuracy and differential		Successful bidder to refer to relevant OEM drawings/manuals
8.5.5	Differential - Fixed/adjustable		Adjustable
8.5.6	Repeatability		0.5% of span
8.5.7	Material of float/displacer spring/tube/ wire rope material/wire rope		Float assembly AISI 316 SS
8.5.8	Body material		Die cast al. housing/ external cage - CS
8.5.9	Type of contacts		SPDT
8.5.10	Number of contacts		2
8.5.11	Contact rating		240V, 5A AC/220V DC, 0.5A
8.5.12	Operating temperature range low limit/ high limit		Successful bidder to refer to relevant OEM drawings/manuals
8.5.13	Dimension		Successful bidder to refer to relevant OEM drawings/manuals
8.5.14	Connection		As necessary
8.5.15	Enclosure class		NEMA 4X

S.no.	Description		
8.5.16	Accessories		Drain & Vent plug on external cage with valves
8.5.17	Detailed literature/drawing ref.		Successful bidder to refer to relevant OEM drawings/manuals
8.6.0	**Temperature Switches (TS)**		
8.6.1	Make/model		Indfoss/Switzer
8.6.2	Type		Mercury filled in
8.6.3	Range		To suit
8.6.4	Accuracy and differential		±0.5% of span/20% of span
8.6.5	Repeatability		±0.5% of span
8.6.6	Type of contacts		SPDT
8.6.7	Number of contacts		2 Nos
8.6.8	Contact rating		240V, 5A AC/220V, 0.5VDC
8.6.9	Operating temperature range low limit/ high limit		LATER
8.6.10	Connection - Process/instrument/ conducit		To match thermowell
8.6.11	Material of thermowell & bulbs, capillary, bourdon tube, movement and casing		Thermowell - As per process requirement bulb, capillary - AISI 316 SS, Movement material-AISI304SS Case material - Die cast al., stove enamelled
8.6.12	Immersion length		Successful bidder to refer to relevant OEM drawings/manuals
8.6.13	Extension neck length/capillary length		Successful bidder to refer to relevant OEM drawings/manuals
8.6.14	Setting/differential		Set point adjustable through out the range/Differential adjustable
8.6.15	Enclosure class		NEMA-4X
8.6.16	Dimensions		Successful bidder to refer to relevant OEM drawings/manuals
8.6.17	Detailed literature/drawing ref.		Successful bidder to refer to relevant OEM drawings/manuals
8.7.0	**Flow switches (FS)**		
8.7.1	Make/model		Switzer/D K Instruments/ Levicon
8.7.2	Type		Vane/paddle type

S.no.	Description		
8.7.3	Material of sensing element and case		AISI 304 SS
8.7.4	Flow range and surge ratio		To suit
8.7.5	Accuracy		±4% of span
8.7.6	Repeatability		±2% of span
8.7.7	Contacts - type rating and number		2 No. SPDT/240V, 5A AC & 220V, 0.5A DC
8.7.8	Enclosure class		NEMA 4X
8.7.9	Connection - Instrument/conduit		1/2" NPT
8.7.10	Accessories		O rings
8.7.11	Detailed literature/drawing ref.		Successful bidder to refer to relevant OEM drawings/manuals
8.8.0	**Solenoid Valves (SV)**		
8.8.1	Make/model		ASCO/Rotex/Avcon
8.8.2	Type		3 port for single coil/ 4 port for double coil
8.8.3	Material:		
	a) Body		Cast steel
	b) Seal		Successful bidder to refer to relevant OEM drawings/manuals
	c) Bonnet gasket		Successful bidder to refer to relevant OEM drawings/manuals
	d) Internal parts		Successful bidder to refer to relevant OEM drawings/manuals
8.8.4	Coil rating/class of insulation		220V DC/Class H
8.8.5	Connection		6 mm O/D, NPT(F)
8.8.6	Enclosure class		Weather & Dust proof
8.8.7	Accessories included		For mounting on body of valve/ burner/igniter assly.
8.8.8	Detailed literature/drawing ref.		Successful bidder to refer to relevant OEM drawings/manuals
8.9.0	**Air Filter Regulator Set**		
8.9.1	Make/model		Savonorgen/Plaka/ equiv.
8.9.2	Type		Filter
8.9.3	Filter - size/material		15 micron/sintered bronze
8.9.4	Air supply pressure - kg/cm square		

S.no.	Description		
	a) Minimum		Successful bidder to refer to relevant OEM drawings/manuals
	b) Maximum		Successful bidder to refer to relevant OEM drawings/manuals
8.9.5	Filter bowl - Transparent/opaque		Transparent
8.9.6	Over pressure rating	kg/cm^2	Upto 250 PSI
8.9.7	Material:		
	a) Body		Die cast Al.
	b) Packing		Successful bidder to refer to relevant OEM drawings/manuals
	c) Diaphragm		Nylon/reinforced neoprene
8.9.8	Accuracy		$\pm$1%
8.9.9	Connection		1/4" NPT
8.9.10	Accessories included		Output pressure gauges
8.9.11	Detailed literature/drawing ref.		Successful bidder to refer to relevant OEM drawings/manuals
8.10.0	**Direct Mounted Level Transmitters (LX)/Controller (LC)**		
8.10.1	**Transmitter (LX)**		
8.10.1.1	Make/model		Bells/equiv.
8.10.1.2	Type		Displacer type
8.10.1.3	Material:		
	i) Body		AISI 304 SS
	ii) Float/tube		AISI 316 SS
8.10.1.4	Output		4-20 mA
8.10.1.5	Accuracy		$\pm$1% span
8.10.1.6	Process connection		1/2" NPT
8.10.1.7	Enclosures		NEMA 4X
8.10.2	**Controllers (LC)**		
8.10.2.1	Make/model		Bells/equivalent
8.10.2.2	Type		Successful bidder to refer to relevant OEM drawings/manuals
8.10.2.3	Accuracy		$\pm$1% of span
8.10.2.4	Hysteresis		$\pm$1% of span

S.no.	Description		
8.10.2.5	Linearity		Successful bidder to refer to relevant OEM drawings/manuals
8.10.2.6	Repeatability		Successful bidder to refer to relevant OEM drawings/manuals
8.10.2.7	Response time		Successful bidder to refer to relevant OEM drawings/manuals
8.10.2.8	Proportional/integral/derivative band		Successful bidder to refer to relevant OEM drawings/manuals
8.10.2.9	Mounting		Direct online
8.10.2.10	Detailed literature/drg reference		Successful bidder to refer to relevant OEM drawings/manuals
8.10.2.11	Dimensions		Successful bidder to refer to relevant OEM drawings/manuals
8.10.2.12	Enclosure class		IP 66
8.11.0	**Electro-pneumatic Converter**		
8.11.1	Make		Rosemount/Bells/IL/Taylor
8.11.2	Type/model No.		Analog to pneumatic converter
8.11.3	Input		4-20 mA
8.11.4	Output	(kg/cm^2)	0.2 to 1.0
8.11.5	Calibration capability		No
8.11.6	Repeatability		$\pm$0.1% of span
8.11.7	Ambient temperature effect		0.5% of span/50°C
8.11.8	Direct/reverse action facility		Successful bidder to refer to relevant OEM drawings/manuals
8.11.9	Enclosure class		IP 66
8.11.10	Dimensions		Successful bidder to refer to relevant OEM drawings/manuals
8.11.11	Mounting		Outdoor bracket/encl. mounting
8.11.12	Accessories		Successful bidder to refer to relevant OEM drawings/manuals
8.11.12.1	Air filter regulator		Yes
8.11.12.2	Output gauge		Yes
8.11.12.3	Connections:		

S.no.	Description		
	a) Electrical		1/4" NPT
	b) Pneumatic		Successful bidder to refer to relevant OEM drawings/manuals
8.11.13	Detailed literature/drawing reference		Successful bidder to refer to relevant OEM drawings/manuals
8.12.0	**Local Pneumatic Controller**		
8.12.1	Make & model No.		Bells/equiv.
8.12.2	Type		Successful bidder to refer to relevant OEM drawings/manuals
8.12.3	Input signal/range	(kg/cm^2)	0.2 to 1
8.12.4	Output signal		To suit
8.12.5	Controller algorithm:		
	a) Protectional band	(%)	5 to 500
	b) Integral limits	(mm)	0.01 to 50
	c) Derivative limit	(mm)	0.01 to 50
8.12.6	Auto manual station		Yes
8.12.7	Enclosure class		IP 65
8.12.8	Air supply pressure		Successful bidder to refer to relevant OEM drawings/manuals
8.12.9	Accessories		Mounting brackets
8.12.10	Detailed literature/Drg ref.		Successful bidder to refer to relevant OEM drawings/manuals

Panel Mounted Instruments and Associated Transmitters

S.no.	Description		
8.0.0	**PANEL MOUNTED INSTRUMENTS & ASSOCIATED TRANSMITTERS**		
8.1.0	**Receiver Indicators (YI)**		
8.1.1	Make, model No.		YBL/ABB/BKT/Fisher Rosemount
8.1.2	Type		Microprocessor
8.1.3	Range		To suit

S.no.	Description		
8.1.4	a) Accuracy		±0.5% of span
	b) Repeatability		±0.5% of span
	c) Dead band		±0.3% of span
8.1.5	Input		4 to 20 mA linear
8.1.6	AC Power supply		230 V
8.1.7	Power requirements (VA burden)		Successful bidder to refer to relevant OEM drawings/manuals
8.1.8	Mounting		Flush
8.1.9	Dimensions		Successful bidder to refer to relevant OEM drawings/manuals
8.1.10	Annunciation contact details		
	a) Number		1 high & 1 low per channel
	b) Type		Successful bidder to refer to relevant OEM drawings/manuals
	c) Rating		240V, 5A AC/220V, 0.5ADC
8.1.11	Power/input connection details		Through Prefab cables
8.1.12	Accessories included with each instrument		Mounting trey, engraved phenolic name plate affixed to front flange to identify each indicator by tag No.
8.1.13	Span adjustment capability limits		Independently adjustable
8.1.14	Zero adjustment capability limits		Independently adjustable
8.1.15	Full scale response time		Successful bidder to refer to relevant OEM drawings/manuals
8.1.16	Detailed literature/drg. ref.		Successful bidder to refer to relevant OEM drawings/manuals
8.1.17	Class of enclosure		IP 40
8.2.0	**Receiver Recorder (YR)**		Not applicable
8.3.0	**Bridge/Potentiometric Recorders (TYR)**		Not applicable
8.4.0	**Transmitters (PX, DPX, LX, FX)**		
8.4.1	Make, Model No.		Rosemount/YBL/THC/BKT /IL

S.no.	Description		
8.4.2	Type		Capacitance
8.4.3	Range		To suit
8.4.4	Accurancy guaranteed for design ambient range		±0.25% of span
8.4.5	Output		4 to 20 mA
8.4.6	Ambient temperature error in percent of span per deg.C		±0.5% of span per 50°C
8.4.7	Ambient temperature range for above listed performance in deg.C		80°C
8.4.8	Hysteresis percent		±0.05% of span
8.4.9	Repeatability percent		±0.05% of span
8.4.10	Operating temperature range in deg.C low limit/high limit		Successful bidder to refer to relevant OEM drawings/manuals
8.4.11	Maximum over range pressure		150%
8.4.12	Integral indicator		Yes
8.4.13	Power supply		24V DC
8.4.13.1	Nominal		24V DC
8.4.13.2	Variation limits		Successful bidder to refer to relevant OEM drawings/manuals
8.4.14	Load impedance		750
8.4.15	Positional effect		Successful bidder to refer to relevant OEM drawings/manuals
8.4.16	Span/zero adjustment		Continuously adjustable & non-interacting
8.4.16.1	External/internal		Continuously adjustable & non-interacting
8.4.16.2	Span adjust limit		Continuously adjustable & non interacting
8.4.16.3	Zero adjust limit		Continuously adjustable & non-interacting
8.4.17	Process connection		1/2" NPT
8.4.18	Accessories included		Mounting bracket suitable for pipe & wall mounting, CS-U Bolts, 2 valve/3 valve manifold
8.4.19	Enclosure class		NEMA-4X

S.no.	Description		
8.4.20	Detailed literature/drawing reference		Successful bidder to refer to relevant OEM drawings/manuals
8.5.0	**Resistance Thermometers (TX)**		
8.5.1	Make, Model No.		Pyroelectric/Indl.inst.
8.5.2	Type		Platinum (Duplex), Ungrounded
8.5.3	Element :		
8.5.3.1	Resistance (ohm)/Gauge		100 ohms at 0°C
8.5.3.2	Sheathed material and OD mm		316 SS and 10 mm O/D approx
8.5.5	Insulation material		Mgo
8.5.6	Accuracy		0.6% of better
8.5.7	Response time		25 sec approx.
8.5.8.1	Construction		Successful bidder to refer to relevant OEM drawings/manuals
8.5.8.2	Process connection		Successful bidder to refer to relevant OEM drawings/manuals
8.5.8.3	Well dimensions		Successful bidder to refer to relevant OEM drawings/manuals
8.5.9	**Head**		
8.5.9.1	Material		Die cast Aluminum
8.5.9.2	Conduit connection		Successful bidder to refer to relevant OEM drawings/manuals
8.5.9.3	Terminal block		Silver plated
8.5.10	Accessories included		Adjustable flanges wherever required.
8.5.11	Detailed literature/drawing reference		Successful bidder to refer to relevant OEM drawings/manuals
8.6.0	**Thermocouples**		
8.6.1	Make, Model No.		Detriv/Pyroelectric/ Indl.Inst
8.6.2	Type		K Type upto 1000°C R type upto 1500°C
8.6.3	Extension wire type		2 wire/4 wire as per

S.no.	Description		
			requirement
8.6.4	Grounded/ungrounded		Ungrounded
8.6.5	Sheathed material and OD mm		316 SS & 10 mm O/D approx.
8.6.6	Insulation material		MgO powder
8.6.7	Accuracy		0.75%
8.6.8	Response time		15 sec.
8.6.9	**Well or tube**		
8.6.9.1	Construction		To suit
8.6.9.2	Material		As per process requirement
8.6.9.3	Dimensions		Successful bidder to refer to relevant OEM drawings/manuals
8.6.9.4	Connections : Process		Successful bidder to refer to relevant OEM drawings/manuals
8.6.10	**Head**		
8.6.10.1	Material		Die cast Al.
8.6.10.2	Conduit connection		3/4" NPT
8.6.10.3	Terminal block		Silver plated
8.6.11	Accessories included		Adjustable flanges wherever required
8.6.12	Detailed literature/drawing reference		Successful bidder to refer to relevant OEM drawings/manuals
8.7.0	**Millivolt/Resistance to Milliamp convertors**		
8.7.1	Make, Model No.		Rosemount/IL/YBL/ BKJ
8.7.2	Type		2 wire
8.7.3	Accuracy		±0.2% of span
8.7.4	Type of primary element		Successful bidder to refer to relevant OEM drawings/manuals
8.7.5	Ambient temperature range		-do-
8.7.6	Sensitivity		± 0.2% of span
8.7.7	Hysteresis		± 0.2% of span
8.7.8	Repeatability		±0.2% of span

S.no.	Description		
8.7.9	Linearity		+0.1% of span
8.7.10	Output signal		4 to 20 mA
8.7.11	Power supply requirements		24V DC
8.7.12	Can accept grounded/ungrounded T/C		Ungrounded T/C
8.7.13	Range adjustment		
8.7.14.1	External/factory set		Factory set
8.7.14.2	Limits of adjustment		Span & zero - continuously adjustable
8.7.15	Cold junction compensation		With suitable thermistor
8.7.16	Enclosure class		NEMA 4X
8.7.17	Detailed literature/drawing reference		Successful bidder to refer to relevant OEM drawings/manuals
8.8.0	**Ammeters (AMM)**		
8.8.1	Make, Model		Successful bidder to refer to relevant OEM drawings/manuals
8.8.2	Type		Successful bidder to refer to relevant OEM drawings/manuals
8.8.3	Input		Successful bidder to refer to relevant OEM drawings/manuals
8.8.4	Range		Successful bidder to refer to relevant OEM drawings/manuals
8.8.5	Accuracy		Successful bidder to refer to relevant OEM drawings/manuals
8.8.6	Zero adjustment		Successful bidder to refer to relevant OEM drawings/manuals
8.8.7	**Dimensions**		
8.8.7.1	Scale		Successful bidder to refer to relevant OEM drawings/manuals
8.8.8	Mounting		Successful bidder to refer to relevant OEM drawings/manuals

S.no.	Description		
8.8.9	Over range protection		Successful bidder to refer to relevant OEM drawings/manuals
8.8.10	Detailed literature/drawings reference		Successful bidder to refer to relevant OEM drawings/manuals
8.9.0	**Illuminated Push Buttons (ILPB)**		
8.9.1	Make/model		Successful bidder to refer to relevant OEM drawings/manuals
8.9.2	Type		-do-
8.9.3	Contact configuration & ratings		2 NO + 2 NC
8.9.4	Lamp supply voltage		24V DC
8.9.5	Series resistor/transformer provided		Yes
8.9.6	Overall dimensions		To fit in mosaic grid
8.9.7	Wattage		12W (typical)
8.9.8	Colour		Red, amber, green
8.9.9	Engraving : Type		Phenolic
8.9.10	Size		Successful bidder to refer to relevant OEM drawings/manuals
8.9.11	Accessories		Successful bidder to refer to relevant OEM drawings/manuals
8.9.12	Detailed literature/drawings reference		Successful bidder to refer to relevant OEM drawings/manuals
8.10.0	**Push Buttons (PB)**		
8.10.1	Make, Model		As per approved vendors
8.10.2	Type		As per approved vendors
8.10.3	Material		As per approved vendors
8.10.4	Number of NO/NC contacts		2NO+2NC
8.10.5	Contact configuration & ratings		Successful bidder to refer to relevant OEM drawings/manuals
8.10.5.1	Breaking capacity		Successful bidder to refer to relevant OEM drawings/manuals

S.no.	Description		
8.10.6	Overall dimensions		Successful bidder to refer to relevant OEM drawings/manuals
8.10.7	Detailed literature/drawings reference		Successful bidder to refer to relevant OEM drawings/manuals
8.11.0	**Indicating Lamps (IL)**		
8.11.1	Make, model		Successful bidder to refer to relevant OEM drawings/manuals
8.11.2	Type		Successful bidder to refer to relevant OEM drawings/manuals
8.11.3	Supply voltage		Successful bidder to refer to relevant OEM drawings/manuals
8.11.4	Permissible voltage variation		Successful bidder to refer to relevant OEM drawings/manuals
8.11.5	Serial resistor/transformer provided		Successful bidder to refer to relevant OEM drawings/manuals
8.11.6	Rating of series resistor		Successful bidder to refer to relevant OEM drawings/manuals
8.11.7	Overall dimensions		Successful bidder to refer to relevant OEM drawings/manuals
8.11.8	Wattage		Successful bidder to refer to relevant OEM drawings/manuals
8.11.9	Life of lamp in burning hours		Successful bidder to refer to relevant OEM drawings/manuals
8.11.10	Engraving details		Successful bidder to refer to relevant OEM drawings/manuals
8.11.11	Detailed literature/drawing reference		Successful bidder to refer to relevant OEM drawings/manuals
8.12.0	**Selector Switches (SS)**		
8.12.1	Make, model		Successful bidder to refer to relevant OEM

S.no.	Description		
			drawings/manuals
8.12.2	Type/number of inputs		Successful bidder to refer to relevant OEM drawings/manuals
8.12.3	Material		Successful bidder to refer to relevant OEM drawings/manuals
8.12.4	Contact configuration & ratings		Successful bidder to refer to relevant OEM drawings/manuals
8.12.4.1	Breaking capacity		Successful bidder to refer to relevant OEM drawings/manuals
8.12.5	Overall dimensions		Successful bidder to refer to relevant OEM drawings/manuals
8.12.6	Detailed literature/drawing reference		Successful bidder to refer to relevant OEM drawings/manuals

Limestone preparation and handling plant

S.no.	Description					
12.0.0	**LIMESTONE PREPARATION AND HANDLING PLANT**					
12.1.0	**Feeders**					
12.1.1	Type	Drag Link	<---------Rotary---------->			Screw
12.1.2	Make	Elecon or Equal	<-----Approved make ------>			Elecon or Equal
12.1.3	Location	Below lime bunkers	Below lime bunkers	Below bag filters	Below lime dust day bins	Below bag filters
12.1.4	Quantity	3	3	3	4	3

S.no.	Description		
12.1.5	Size		Successful bidder to refer to relevant OEM drawings/manuals
12.1.6	Capacity - each	(tphr)	125 125 15 80 15
12.1.7	Overall dimensions		Successful bidder to refer to relevant OEM drawings/manuals
12.1.8	Reference to manufacturer's drawings		Successful bidder to refer to relevant OEM drawings/manuals
12.1.9	Drive detail		<---------- Direct AC motor driven ---------->
12.1.10	Motor rating		Successful bidder to refer to relevant OEM drawings/manuals
12.1.11	Construction materials:		
	a) Body		<---------- Steel ---------->
	b) Internals		<---------- MS ---------->
	c) Chain		<---------- Alloy Steel AISI-1330 ---------->
12.1.12	Weight		Successful bidder to refer to relevant OEM drawings/manuals
12.2.0	**Limestock Crushers**		
12.2.1	Location		Below Lime bunkers
12.2.2	Make/Model		L&T-Hazemag Novorotor II-1300/2500 or Equal
12.2.3	Quantity		Three (3)
12.2.4	Capacity - each	(tphr)	125
12.2.5	Approximate overall dimensions	(M)	5.8 x 5.6 x 2.2
12.2.6	Reference to manufacturer's drawing		Successful bidder to refer to relevant OEM drawings/manuals
12.2.7	Motor rating	(kW)	355
12.2.8	Power input to motor		Successful bidder to refer to relevant OEM drawings/manuals
12.2.9	Construction materials:		

S.no.	Description			
	a) Casing		Manganese Steel	
	b) Rollers		Manganese Steel	
	c) Base frame		Steel	
12.2.10	Approximate weights	(tonnes)	44.5	
12.3.0	**Lime Dust(150 to 750 microns) Hoppers**		Buffer Hoppers	Day Bins
12.3.1	Location		Below lime bunkers in Boiler area	In Plant building columns C/D bay in between lignite bunkers
12.3.2	Quantity		3	2
12.3.3	Capacity - each	(cum)	30	450
12.3.4	Size	(M)	6 dia x 2 (straight) height	7.5 dia x 11 (straight) + 6M (tapered) height
12.3.5	Construction material		<------- Stainless Steel cladded steel ------->	
12.3.6	Plate thickness		<---------- 6 mm ---------->	
12.4.0	**Dense-Phase Vessels**			
12.4.1	Location		Below lime dust buffer hoppers	
12.4.2	Quantity		16	
12.4.3	Capacity - each	(cum)	3.5	
12.4.4	Size	(M)	1.5 dia (max.)	
12.4.5	Material of construction		Steel	
12.4.6	Plate thickness	(mm)	10	
12.5.0	**Compressors**			
12.5.1	Duty		Lime Conveying	Lime Transport
12.5.2	Location		Near lime dust buffer hoppers [in Boiler area]	Near screw pumps [in C/D bay of Plant building]

S.no.	Description		
12.5.3	Quantity	2	4
12.5.4	Capacity - approx. (m^3/hr)	2500	4200
12.5.5	Discharge pressure (bar)	2.5	1.25
12.5.5	Type	<---------- Reciprocating ---------->	
12.5.6	Motor rating	Successful bidder to refer to relevant OEM drawings/manuals	
12.5.7	Power input to motor	Successful bidder to refer to relevant OEM drawings/manuals	
12.6.0	**Screw Pumps**		
12.6.1	Location	In plant building C/D bay in between Lignite bunkers	
12.6.2	Make	IBAU-Hamberg type IB-D300	
12.6.3	Quantity	4	
12.6.4	Capacity (tphr)	80	
12.6.5	Motor rating	Successful bidder to refer to relevant OEM drawings/manuals	
12.6.6	Power input to motor	Successful bidder to refer to relevant OEM drawings/manuals	
12.6.7	Feed rate	Variable 0 to 100%	
12.6.8	Construction features & materials:		
	a) Construction	Pump screw carried in 2 robust bearings on side with exchangeable casted end fligh	
	b) Body	Heavy cast alloy	
	c) End flight	Wear resistant alloy casting	
	d) Shaft	Screw shaft with conical connection to stiff rotating shaft barrel supported by 2 roller bearings	
	e) Shaft sealing	With stuffing box and purge air seal, oil bath and oil spray lubrication	
12.6.9	Accessories	i) Oil gauge & oil temp thermometer on bearing housing	

S.no.	Description		
			ii) Discharge box with non-return flap, adjustable through counter-weight
			iii) Inspection lid
			iv) Material discharge flange
			v) Back pressure measuring device
			vi) Measuring & adjusting purge air pressure
			vii) Measuring suply air pressure
			viii) Elastic/coupling with guard
12.7.0	**Hot Gas Generator**		
12.7.1	Quantity		One (1)
12.7.2	Heat release capacity - Approx.	Mkcal/hr	6
12.7.3	Hot air quantity - approx.	(kg/hr)	125000
12.7.4	Hot air temperature	(°C)	200
12.7.5	Type of fuel		Furnace oil (HFO)
12.7.6	Fuel oil consumption - approx.	(kg/hr)	**600**
12.7.7	Overall size	(M)	Successful bidder to refer to relevant OEM drawings/manuals
12.7.8	Weight	(Kg)	Successful bidder to refer to relevant OEM drawings/manuals
12.8.0	**Dust Extraction Equipment [Bag filters with Vent Fan]**		
12.8.1	Make		Batliboi/Thermax
12.8.2	Location		Top of lime dust bins [in plant building C/D bay] / Above lime crushers [in Boiler area]
12.8.3	Quantity		2 / 3
12.8.4	Type		<---------- Pulse Jet type ---------->

S.no.	Description		
12.8.5	Capacity		Successful bidder to refer to relevant OEM drawings/manuals
12.8.6	Dust concentration of air (outlet to atmosphere)	mg/Nm^3	<---------- 50 ---------->
12.8.7	Material of construction:		
	a) Casing		<---------- Mild Steel ---------->
	b) Bags		<---------- Polythene ---------->
12.9.0	**Vent Fans**		
12.9.1	Type		Centrifugal fan with backward inclined blade
12.9.2	Capacity - approx.	(cum/hr)	20000 10000
12.9.3	Static pressure - approx.	(mmwg)	400 400
12.9.4	Motor rating		Successful bidder to refer to relevant OEM drawings/manuals

Bed ash handling system

S.no.	Description		
13.0.0	**BED ASH HANDLING SYSTEM**		
13.1.0	**Bed Ash Cooler**		
13.1.1	Quantity per boiler		Two (2)
13.1.2	Location		At ground level below furnace
13.1.3	Number of sections per each ash cooler		Two (2)
13.1.4	Bed ash inlet temperature	(°C)	850
13.1.5	Bed ash outlet temperature	(°C)	130 (max. 260)
13.1.6	Bed ash inlet opening size to cooler - approx.	(mm)	650 to 1080

S.no.	Description		
13.1.7	Bed ash cooler outlet arrangement & size from cooler		Through 2 funnels piped for feeding on drag link conveyor
13.1.8	Bed ash nozzles:		
	a) Quantity		Successful bidder to refer to relevant OEM drawings/manuals
	b) Material		Successful bidder to refer to relevant OEM drawings/manuals
13.1.9	Air supply nozzle size to bed ash nozzles		500 mm dia
13.1.10	Air supply source		Plant Service air
13.1.11	Bed ash cooler outlet size - approx.	(mm)	390
			Performance Lignite / Worst Lignite
13.1.12	Nominal discharge capacity	(tphr)	11.3 / 30.2
13.1.13	Max. discharge capacity	(tphr)	16.2 / 41.4
13.1.14	Bed ash temperature	(°C)	<---------- 260 ---------->
13.1.15	Elevation of bed ash cooler outlet nozzle above grade level		Successful bidder to refer to relevant OEM drawings/manuals
13.1.16	Bed ash cooler outlet funnel		3 Nos.
13.1.17	L-valve size		300 mm NB
13.1.18	RO cooling water [flowing through ash cooler]: parameters		
	a) Water pressure	(bar)	8
	b) Water inlet temp.	(°C)	40 to 60
	c) Water outlet temp.	(°C)	55 to 99

S.no.	Description					
13.1.19	Accessories		Filters; relief valves on water circuit; hydraulic/control/motor operated valves			
13.1.20	Overall dimensions		Successful bidder to refer to relevant OEM drawings/manuals			
13.1.21	Weight	(Kg.)	Successful bidder to refer to relevant OEM drawings/manuals			
13.1.22	Mounting details		Successful bidder to refer to relevant OEM drawings/manuals			
13.2.0	**Plate Heat Exchanger [2 Nos. per Boiler]**					
13.2.1	Quantity per each boiler		Two (2)			
13.2.2	Total number (approx) of plates in each PHE		76			
13.2.3	Plate material		Titanium			
13.2.4	Plate thickness	(mm)	0.5			
13.2.5	Heat transfer area - approx.	(Sq.M)	37			
13.2.6	Operating parameters		<u>Primary Side</u>		<u>Secondary Side</u>	
	a) Lignite quality		Perf orm-ance lignit e	Worst Lignite	Perform-ance lignite	Worst Lignit e
	b) Flowing media		RO Water		Sea	
	c) Mass flow rate	(tphr)	180	360	310	1238
	d) Inlet temperature	(°C)	55	90	34	34
	e) Outlet temperature	(°C)	40	60	42	42
	f) Pressure drop	(MWC)	4	3.5	10	10

S.no.	Description		
13.2.7	Accessories for each PHE		Special spanner; set of foundation bolts; valves & filters; temperature & pressure gauges; expansion joints; cleaning device; gaskets; brackets; supports; and suspension
13.3.0	**Drag Link Conveyor**		<---------- Lignite ---------->
13.3.1	Fired lignite quality		Performance Worst
13.3.2	Quantity per boiler		<---------- 2 ---------->
13.3.3	Type		Drag link type conveyor enclosed constructiondriven by AC electric motor drive externally mounted.
13.3.4	Number of inlet bed ash points on to each conveyor		<---------- 5 ---------->
13.3.5	Sizes of bed ash pipes on to conveyor		Successful bidder to refer to relevant OEM drawings/manuals
13.3.6	Nominal capacity	(tphr)	<0.35 <1.3
13.3.7	Maximum capacity	(tphr)	0.35 1.3
13.3.8	Bed ash particle size	(mm)	<--------- 0 to 6 (max. 10 mm) ---------->
13.3.9	Bed ash operating temp. (approx.)	(°C)	150 350
13.3.10	Bed ash removal capacity		<---------- 2 tonnes per shift ---------->
13.3.11	Construction materials:		
	a) Casing		Steel
	b) Scraper chain		Alloy Steel AISI-1330
	c) Scraper bars		14% Mn steel
	d) Guide pulleys		Mchanite CI (260 BHN)

S.no.	Description		
	e) Drive sprocket		Low alloy steel AISI-C-1137
13.3.12	Drive motor rating		Successful bidder to refer to relevant OEM drawings/manuals
13.3.13	Overall length [Straight/Inclided portion]	(M)	Successful bidder to refer to relevant OEM drawings/manuals
13.3.14	Overall width	(M)	Successful bidder to refer to relevant OEM drawings/manuals
13.3.15	Weight	(Kg.)	Successful bidder to refer to relevant OEM drawings/manuals
13.4.0	**RO Water Circuit Pumpset**		
13.4.1	Quantity per each boiler		Two (2)
13.4.2	Type		Horizontal centrifugal backpull type directly coupled to motor
13.4.3	Capacity (approx.)	(tphr)	180
13.4.4	Discharge pressure (approx)	(bar)	7
13.4.5	Operating temperature	(°C)	40 to 60
13.4.6	Construction materials:		
	a) Casing		Stainless Steel CF8M
	b) Impeller		Stainless Steel CF8M
	c) Shaft		Stainless Steel 410
13.4.7	Pump efficiency		Successful bidder to refer to relevant OEM drawings/manuals
13.4.8	Pump suction discharge nozzle sizes		Successful bidder to refer to relevant OEM drawings/manuals
13.4.9	Motor rating		Successful bidder to refer to relevant OEM drawings/manuals

S.no.	Description		
13.4.10	Power input to motor		Successful bidder to refer to relevant OEM drawings/manuals
13.4.11	Overall dimensions	(mm)	Successful bidder to refer to relevant OEM drawings/manuals
13.4.12	Weight	(kg.)	Successful bidder to refer to relevant OEM drawings/manuals

Condensate floating tank and Boiler fill pump

S.no.	Description		
14.1.0	**Condensate Floating Tank**		
14.1.1	Quantity per boiler		One (1)
14.1.2	Capacity	(cum)	350
14.1.3	Overall dimensions	(M)	7.5 dia x 9 height
14.1.4	Code/Standards		As per IS:803-1976
14.1.5	Design parameters		Atmospheric pressure and 50°C temp.
14.1.6	Construction		Vertical cylindrical
14.1.7	Thickness - shell/bottom/top	(mm)	8 M x 7.14 M
14.1.8	Accessories		Float type level indicator; level switches; Carbondioxide absorber; manholes; flanged nozzles; Spiral staircase outside; ladder inside
14.2.0	**Boiler Fill Pump**		
14.2.1	Quantity per boiler		2 x 100%
14.2.2	Type		Horizontal centrifugal back pullout type
14.2.3	Capacity	(tphr)	100
14.2.4	Discharge pressure	kg/cm^2g	15

S.no.	Description		
14.2.5	Operating speed	(rpm)	2900
14.2.6	Construction materials:		
	a) Casing		Stainless Steel CF8M
	b) Impeller		Stainless Steel CF8M
	c) Shaft		Stainless Steel A-410
14.2.7	Power input to motor		Successful bidder to refer to relevant OEM drawings/manuals
14.2.8	Motor rating	(kW)	Successful bidder to refer to relevant OEM drawings/manuals
14.2.9	Overall dimensions	(M)	Successful bidder to refer to relevant OEM drawings/manuals
14.2.10	Weight	(Kg.)	Successful bidder to refer to relevant OEM drawings/manuals

External piping

Sl. No.	Description	Pipe size (mmNB)	Materials		Operating parameters	
			Piping	Fittings	Pressure (bar)	Temperature (°C)
1.	**System: MS: Main Steam**					
a)	Boiler to turbine (left 203 tphr)	200	ASTM A335 P91	ASTM A335 P91 (R=5D/3D)	140	540
b)	Boiler to turbine (right 203 tphr)	200	ASTM A335 P91	ASTM A335 P91 (R=5D/3D)	140	540
c)	Equalizing line	200	ASTM A335 P91	ASTM A335 P91 (R=5D/3D)	140	540
d)	To Auxiliary Steam PRDS (50 tph)	100	ASTM A335 P22	ASTM A335 P91 (R=5D/3D)	140	540
e)	Auxiliary steam PRDS (10 tph)	50	ASTM A335 P22	ASTM A182 P22	140	540
f)	HP Bypass warm up line	50	ASTM A335 P22	ASTM A182 P22	140	540

Sl. No.	Description	Pipe size (mmNB)	Materials		Operating parameters	
			Piping	Fittings	Pressure (bar)	Temperature (°C)
g)	Drains and vents	50	ASTM A335 P22	ASTM A182 P22	140	540
h)	Drains and vents	50	ASTM A335 P22	ASTM A182 P22	140	540
2.	**System: CRH: Cold Reheat from**					
a)	Turbine to HP Bypass (360 tph)	500	ASTM A335 P22	ASTM A335 P22 (R=5D/3D)	38	500
b)	HP Bypass to Boiler (360 tph)	500	ASTM A106 Gr.C	ASTM A234 WPC (R=5D/3D)	38	342
c)	To Boiler leg (left: 180 tph)	350	ASTM A106 Gr.C	ASTM A234 WPC (R=5D/3D)	38	342
d)	To Boiler leg (right: 180 tph)	350	ASTM A106 Gr.C	ASTM A234 WPC (R=5D/3D)	38	342
e)	To Deaerator	150	ASTM A106 Gr.C	ASTM A234 WPC (R=5D/3D)	38	342
f)	Cold reheat Drains and vents	50	ASTM A106 Gr.C	ASTM A105	38	342
g)	Cold reheat Drains and vents	25	ASTM A106 Gr.C	ASTM A105	38	342
3.	**System: HRH: Hot Reheat**					
a)	Boiler to turbine (left 180 tphr)	400	ASTM A335 P22	ASTM A335 P22 (R=5D/3D)	36	540
b)	Boiler to turbine (right 180 tphr)	400	ASTM A335 P22	ASTM A335 P22 (R=5D/3D)	36	540
c)	Equalizing line	400	ASTM A335 P22	ASTM A335 P22 (R=5D/3D)	36	540
d)	Warm-up line	50	ASTM A335 P22	ASTM A182 P22	36	540
e)	Hot reheat Drains and vents	50	ASTM A335 P22	ASTM A182 P22	36	540
f)	To Flash box	25	ASTM A335 P22	ASTM A182 P22	36	540
4.	**System: HPB : HP Bypass**					

Sl. No.	Description	Pipe size (mmNB)	Materials		Operating parameters	
			Piping	Fittings	Pressure (bar)	Temperature (°C)
a)	Upstream 30% (left:121.5 tph)	150	ASTM A335 P22	ASTM A335 P22 [R=5D/3D]	140	540
b)	Upstream 30% (right:121.5 tph)	150	ASTM A335 P22	ASTM A335 P22 [R=5D/3D]	140	540
c)	Downstream (left)	250	ASTM A335 P22	ASTM A335 P22 [R=5D]	38	540
d)	Downstream (right)	250	ASTM A335 P22	ASTM A335 P22 [R=5D]	38	540
5.	**System: LPB : LP Bypass**					
a)	Upstream 50% (180 tph) [left]	300	ASTM A335 P22	ASTM A335 P22 [R=5D]	38	540
b)	Upstream 50% (180 tph) [right]	300	ASTM A335 P22	ASTM A335 P22 [R=5D]	38	540
c)	Downstream (10 bar)	500	ASTM A335 P22	ASTM A335 P22 [R=5D]	38	540
6.	**System: BFD: Boiler Feed Discharge from**					
a)	Pump I (300 tphr)	150	ASTM A106 Gr.C	ASTM A106 Gr.C [R=5D/3D]	240	230
b)	Pump II (300 tphr)	150	ASTM A106 Gr.C	ASTM A106 Gr.C [R=5D/3D]	240	230
c)	Pump III (300 tphr)	150	ASTM A106 Gr.C	ASTM A106 Gr.C [R=5D/3D]	240	230
d)	Header to HP heater 6+7 (506 tphr)	200	ASTM A106 Gr.C	ASTM A106 Gr.C or ASTM A234 WPC [R=5D]	240	230
e)	Header from HP heater 6+7 to Economizer (506 tphr)	200	ASTM A106 Gr.C	ASTM A106 Gr.C or ASTM A234 WPC [R=5D]	240	250

Sl. No.	Description	Pipe size (mmNB)	Materials		Operating parameters	
			Piping	Fittings	Pressure (bar)	Temperature (°C)
f)	BFD pipework drains and vents	25	ASTM A106 Gr.C	ASTM A105	240	230
g)	Minimum flow from pump I to FW tank	65	ASTM A106 Gr.C	ASTM A106 Gr.C (R=5D/3D) or ASTM A234 WPC	240	230
h)	Minimum flow from pump II to FW tank	65	ASTM A106 Gr.C	ASTM A106 Gr.C (R=5D/3D) or ASTM A234 WPC	240	230
i)	Minimum flow from pump III to FW tank	65	ASTM A106 Gr.C	ASTM A106 Gr.C (R=5D/3D) or ASTM A234 WPC	240	230
7.	**System: BFL : Balancing Drum Leakoff from**					
a)	Boiler feed pump I	50	ASTM A106 Gr.C	ASTM A105	120	230
b)	Boiler feed pump II	50	ASTM A106 Gr.C	ASTM A105	120	230
c)	Boiler feed pump III	50	ASTM A106 Gr.C	ASTM A105	120	230
8.	**System SP : Spray Water**					
a)	Spray water Header from BFD system	80	ASTM A106 Gr.C	ASTM A106 Gr.C [R=5D] or ASTM-A234 WPC	240	250
b)	Spray water to SH control station	50	ASTM A106 Gr.C	ASTM A105	240	250
c)	Spray water from BF pump to RH control station	50	ASTM A106 Gr.C	ASTM A105	240	230

Sl. No.	Description	Pipe size (mmNB)	Materials		Operating parameters	
			Piping	Fittings	Pressure (bar)	Temperature (°C)
d)	Spray water from BFD pump to RH control station	65	ASTM A106 Gr.C	ASTM A106 Gr.C [R=5D] or ASTM-A234 WPC	240	230
e)	Spray water to Auxiliary PRDS	50	ASTM A106 Gr.C	ASTM A105	240	230
f)	Spray water to Auxiliary PRDS	65	ASTM A106 Gr.C	ASTM A106 Gr.C (R=5D/3D) or ASTM-A234 WPC	240	230
g)	Spray water to HPB valve	50	ASTM A106 Gr.C	ASTM A105	240	230
h)	Spray water to HPB valve	25	ASTM A106 Gr.C	ASTM A105	240	230
i)	Spray water to HPB valve	40	ASTM A106 Gr.C	ASTM A105	240	230
9.	**Spray AS/2U : Auxiliary Steam for 2 units**					
a)	To SCAPH	150	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D] or ASTM-A234WPB	18	250
b)	Service pipes	100	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D] or ASTM-A234WPB	18	250
c)	Service pipes	50	ASTM A106 Gr.B	ASTM A105	18	250
d)	Interconnecting pipes	150	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D] or ASTM-A234WPB	18	250
e)	Oil tank & unloading	100	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D] or ASTM-A234WPB	18	250
f)	Drains & vents	25	ASTM A106 Gr.B	ASTM A105	18	250

Sl. No.	Description	Pipe size (mmNB)	Materials		Operating parameters	
			Piping	Fittings	Pressure (bar)	Temperature (°C)
10.	**System : AS/U1 : Auxiliary Steam per unit**					
a)	From PRDS (40t/h)	250	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D] or A234WPB	18	250
b)	From PRDS (10t/h)	100	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D] or A234WPB	18	250
c)	Unit header (16 bar)	300	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D] or ASTM-A234WPB	18	250
d)	Unit drain & vents	25	ASTM A106 Gr.B	ASTM A105	18	250
e)	Unit drain & vents	25	ASTM A106 Gr.B	ASTM A105	18	250
11.	**System CS : Condensate System**					
a)	From Tank to Boiler Fill pump (100 tph)	150	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D] or ASTM A105	15	40
b)	From Boiler fill pump to FW tank (100 tph)	100	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D] or ASTM A105	15	40
c)	To Boiler filling line	100	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D] or ASTM A105	15	40
d)	Interconnecting piping to Unit II	100	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D] or ASTM A105	15	40
e)	Drain and vents	50	ASTM A106 Gr.B	ASTM A105	15	40
f)	Drain and vents	25	ASTM A106 Gr.B	ASTM A105	15	40
g)	From floating tank to drain	150	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D] or ASTM A105	15	40

Sl. No.	Description	Pipe size (mmNB)	Materials		Operating parameters	
			Piping	Fittings	Pressure (bar)	Temperature (°C)
h)	Steam coil air preheater Unit-I	80	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D] or ASTM A105	15	40
i)	Steam coil air preheater Unit-II	50	ASTM A106 Gr.B	ASTM A105	15	40
12.	**System : Ex: Exhaust Pipes**					
a)	Exhaust pipes	500	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D]	-	-
b)	Exhaust pipes	400	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D] or ASTM A234 Gr. WPB	-	-
c)	Exhaust pipes	300	ASTM A106 Gr.B	ASTM A106 Gr.B [R=1.5D] or ASTM A234 Gr. WPB	-	-

Annexure 2: Spares for Boiler Overhaul

Plan 1: Auxiliary Boiler

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
1	Aux. Boiler	Waterwall		Nos (as detailed below)	1264	Common	Y	
1.1	Aux. Boiler	Tube 1	Tube size: 50.8mmx3.66mmx3377mm, t-01 moc: bs 3059 pt-ii, material-360 with IBR certificate and material test certificate	Nos	73	Common	Y	
1.2	Aux. Boiler	Tube 2	Tube size: 50.8mmx3.66mmx3210mm, t-02 moc: bs 3059 pt-ii, material-360 with IBR certificate and material test certificate	Nos	73	Common	Y	
1.3	Aux. Boiler	Tube 3	Tube size: 50.8mmx3.66mmx2993mm, t-03 moc: bs 3059 pt-ii, material-360 with IBR certificate and material test certificate	Nos	60	Common	Y	
1.4	Aux. Boiler	Tube 4 & 17	Tube size:50.8mmx3.66mmx2704mm, t-04 & 17 moc: bs 3059 pt-ii, material-360 with IBR certificate and material test certificate	Nos	120	Common	Y	
1.5	Aux. Boiler	Tube 5 & 16	Tube size:50.8mmx3.66mmx2515mm, t-05 & 16 moc: bs 3059 pt-ii, material-360 with IBR certificate and material test certificate	Nos	120	Common	Y	
1.6	Aux. Boiler	Tube 6 &15	Tube size:50.8mmx3.66mmx2365mm, t-06 & 15 moc: bs 3059 pt-ii, material-360 with IBR certificate with ibr certificate and material test certificate	Nos	120	Common	Y	
1.7	Aux. Boiler	Tube 7 & 14	Tube size:50.8mmx3.66mmx2240mm, t-07 & 14 moc: bs 3059 pt-ii, material-360 with IBR certificate and material test certificate	Nos	120	Common	Y	
1.8	Aux. Boiler	Tube 8 & 13	Tube size:50.8mmx3.66mmx2162mm, t-8 & 13 moc: bs 3059 pt-ii, material-360 with IBR certificate and material test certificate	Nos	120	Common	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
1.9	Aux. Boiler	Tube 9 &12	Tube size:50.8mmx3.66mmx2103 mm, t-9 & 12 moc: bs 3059 pt-ii, material-360 with IBR certificate and material test certificate	Nos	120	Common	Y	
1.10	Aux. Boiler	Tube 10 & 11	Tube size:50.8mmx3.66mmx2074 mm, t-10 & 11 moc: bs 3059 pt-ii, material-360 with IBR certificate and material test certificate	Nos	120	Common	Y	
1.11	Aux. Boiler	Tube 18	Tube size:50.8mmx3.66mmx2933mm, t-018, moc: bs 3059 pt-ii, material-360 with IBR certificate and material test certificate	Nos	67	Common	Y	
1.12	Aux. Boiler	Tube 19	Tube size:50.8mmx3.66mmx3069mm, t-19, moc: bs 3059 pt-ii, material-360 with IBR certificate and material test certificate	Nos	66	Common	Y	
1.13	Aux. Boiler	Tube 20	Tube size: 50.8mmx4.06mmx7680mm, t-20, moc: bs3059 pt-ii, material-360 with IBR certificate and material test certificate	Nos	43	Common	Y	
1.14	Aux. Boiler	Tube 21	Tube size: 50.8mmx4.06mmx7718mm, t-21, moc: bs3059 pt-ii, material-360 with IBR certificate and material test certificate	Nos	42	Common	Y	
2	Aux. Boiler	Super heater panel		Nos (as detailed below)	54	Common	Y	
2.1	Aux. Boiler	Tube 2	TUBE SIZE: 38.1MMX4.06MMX3872MM, MOC: SA 213 T11	Nos	13	Common	Y	
2.2	Aux. Boiler	Tube 2	TUBE SIZE: 38.1MMX4.06MMX6565MM, MOC: BS 3059 P11 360 SMLS	Nos	13	Common	Y	
2.3	Aux. Boiler	Tube 1	TUBE SIZE: 38.1MMX4.06MMX3982MM, MOC: SA 213 T11	Nos	14	Common	Y	
2.4	Aux. Boiler	Tube 1	TUBE SIZE: 38.1MMX4.06MMX6675MM, MOC: BS 3059 P11 360 SMLS	Nos	14	Common	Y	
3	Aux. Boiler	Insulation	100mm thickness	mtr2	60	Common	Y	
4	Aux. Boiler	Aluminum coil	0.5 mm thickness	mtr2	60	Common	Y	
5	Aux. Boiler	Baffle plate	CS Plate - 4 mm	Tons	1	Common	Y	
6	Aux. Boiler	Baffle plate	CS flat sheet - 50mm * 5 mm	Mtr	60	Common	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
7	Startup Vent Aux. Boiler	Gate valve	65NB	Nos	1	Common	Y	
8	MS Line Aux. Boiler	Gate Valve	6", 300 class	Nos	3	Common	Y	
9	Aux Boiler	Fins	Size – 40mm x 6 mm CS	Mtr	800	Common	Y	

Plan 2: Ash Handling System

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
1	Bottom ash draglink	Bottom Ash draglink	Machine type:TKF400/1, Chain type:50/25/142-E, Chain width-400mm , Flight Pitch-142mm, Chain speed - 0.07m/s., Distane between conveyor centre - 11369mm, Line layout - Harizontal/ inclined 40 deg. , Manufacturer - SMD Fordertechnik GmbH	Nos	4	Unit 1 and Unit 2	Y	
2	Ash draglink conveyor	Chain link and flight	CONVEYOR CHAIN AS FORGED FORK LINK CHAIN MADE OF 20MnCr5 EQUIPPED WITH SCRAPPER EVERY 142 MM FOR ASH DRAGLINK CONVEYOR	Nos	800	Unit 1 and Unit 2	Y	
3	Refractory	Refractory	LCC 50	Ton	104.56	Unit 1 and Unit 2		Y
4	Refractory	Refractory	11 Li	Ton	69.64	Unit 1 and Unit 2		Y
5	Refractory	Refractory	LCC 80 GN	Ton	10	Unit 1 and Unit 2		Y

Plan 3: Boiler non-pressure parts

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
1	Loop Seal bellow	Metallic bellow	METALLIC EXPANSION JOINT FOR LOOP SEAL TEMPERATURE-1200 0 C, PRESSURE 2500 MMWC, AXIAL MOVEMENT +120 MM, LATERAL MOVEMENT 25 MM, MEDIA: WASTE GAS/ASH/HOT GAS/LIGNITE AS PER DRAWING	Nos	3	Unit 1 and Unit 2	Y	
2	Refractory	Loop seal return leg	LCC 80	Ton	39.52	Unit 1		Y
3	Refractory	Loop seal return leg	11 Li	Ton	28.944	Unit 1		Y
4	Refractory	Loop seal return leg	LCC 80	Ton	39.52	Unit 2		Y
5	Refractory	Loop seal return leg	11 Li	Ton	28.944	Unit 2		Y
6	Refractory	Loop seal return leg	LCC 80 GN	Ton	10	Unit 1 and Unit 2		Y
7	Refractory	Loop seal syphone seal	LCC 80	Ton	6.54	Unit 1		Y
8	Refractory	Loop seal syphone seal	11 Li	Ton	4.82	Unit 1		Y
9	Refractory	Loop seal syphone seal	LCC 80	Ton	6.54	Unit 2		Y
10	Refractory	Loop seal syphone seal	11 Li	Ton	4.82	Unit 2		Y

Plan 4: Boiler pressure parts

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
1	Furnace and 2nd pass	Furnace nozzle	NOZZLE TIP FOR FURNACE AS PER DRG. NO.1.47741/00 882-0003, INNER TUBE FOR FURNACE NOZZLE AS PER DRG. NO.1.47741/00 882-0004, FURNACE NOZZLE FITTING TUBE, OD : 48 MM X ID : 38 MM , MOC : SS 310, THREAD PITCH : 5/8 "	Set	2200	Unit 1 and Unit 2	Y	
2	Furnace and 2nd pass	Water wall	57.1*8.1, SA 210 GRA1	Mtr	120	Unit 1 and Unit 2	Y	
3	Furnace and 2nd pass	Evaporator bottom tubes	88.9*11.1 SA 106 Gr B Tube	Mtr	60	Unit 1 and Unit 2	Y	
4	Furnace and 2nd pass	Furnace bed tubes	88.9 X 11.1 SA 106 GR. B HFS 1998 WITH ADDENDA 1999	Mtr	100	Unit 1 and Unit 2		Y
5	Furnace and 2nd pass	Furnace	48.3 X 5.6 mm, SA 210 Gr. A1 HFS 1998 With Addenda 1999.	Mtr	700	Unit 1 and Unit 2		Y
6	Furnace and 2nd pass	Evaporator Tube - 1	57.1 X 8.1 mm, SA 210 Gr. A1 HFS 1998 With Addenda 1999.	Mtr	1400	Unit 1 and Unit 2		Y
7	Furnace and 2nd pass	Evaporator Tube - 2	57.1 X 6.1 mm, SA 210 Gr. A1 HFS 1998 With Addenda 1999.	Mtr	2800	Unit 1 and Unit 2		Y
8	Furnace and 2nd pass	Evaporator intermediate wall tubes	57.1 X 6.1 mm, SA 210 Gr. A1 HFS 1998 With Addenda 1999.	Mtr	290	Unit 1 and Unit 2		Y
9	Furnace and 2nd pass	Superheater-4 tubes (Omega)	48.3 X 5.6 mm, SA 213 Gr. T91 HFS 1998 With Addenda 1999.	Mtr	1350	Unit 1 and Unit 2		Y
10	Furnace and 2nd pass	Reheater-2 tubes (Omega)	48.3 X 5.6 mm, SA 213 Gr. T91 HFS 1998 With Addenda 1999.	Mtr	1400	Unit 1 and Unit 2		Y
11	2nd pass	2nd pass inlet bellow	NMEJ CYLONE OUTLETS TAG NO.-EJ-3 TYPE: F-TYPE FABRIC COMBINATION SUITABLE FOR LIGNITE WITH CONTAINING SULPHER AS PER 4 DIMENSIONS SIZE:4765MMX8312MM, WIDTH:500MM, WITH BOLT, NUT & WASHER	Nos	2	Unit 1 and Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
12	2nd pass	Forced flow (eco.) section tubes.	38.1 X 4.2 SA 210 GR. A1 HFS 1998 WITH ADDENDA 1999 No. of Tubes - 2880 (80*4*18*6), Length - 11 m	Mtr	12400	Unit 1 and Unit 2		Y
13	2nd pass	2nd pass upper hanger tubes (sh1)	44.5 X 8.6 SA 210 GR. A1 HFS 1998 WITH ADDENDA 1999No. of Tubes - 160, Length - 15 m	Mtr	120	Unit 1 and Unit 2		Y
14	2nd pass	2nd pass lower hanger tubes (sh2)	42.2 X 7.6 SA 210 GR. A1 HFS 1998 WITH ADDENDA 1999No. of Tubes - 160, Length - 15 m	Mtr	120	Unit 1 and Unit 2		Y
15	2nd pass	2nd pass front wall tubes (sh1), lh / rh side walls tubes (sh2), rear wall tubes (sh2)	31.8 X 4.2 SA 210 GR. A1 HFS 1998 WITH ADDENDA 1999No. of Tubes - 520, Length - 30 m	Mtr	3120	Unit 1 and Unit 2		Y
16	2nd pass	Super heater 3 tube - 1	38.1 X 3.8 SA 213 GR. T11 HFS 1998 WITH ADDENDA 1999No. of Tubes - 320 (80*4), Length - 12 m	Mtr	780	Unit 1 and Unit 2		Y
17	2nd pass	Super heater 3 tube - 2	38.1 X 4.2 SA 213 GR. T11 HFS 1998 WITH ADDENDA 1999No. of Tubes - 320 (80*4), Length - 12 m	Mtr	780	Unit 1 and Unit 2		Y
18	2nd pass	Super heater 3 tube - 3	38.1 X 5.6 SA 213 GR. T11 HFS 1998 WITH ADDENDA 1999No. of Tubes - 320 (80*4), Length - 12 m	Mtr	780	Unit 1 and Unit 2		Y
19	2nd pass	Super heater 5 tube - 1	44.5 X 6.6 SA 213 GR. T22 HFS 1998 WITH ADDENDA 1999No. of Tubes - 320 (80*4), Length - 12 m	Mtr	780	Unit 1 and Unit 2		Y
20	2nd pass	Super heater 5 tube - 2	44.5 X 7.6 SA 213 GR. T22 HFS 1998 WITH ADDENDA 1999No. of Tubes - 320 (80*4), Length - 12 m	Mtr	780	Unit 1 and Unit 2		Y
21	2nd pass	Super heater 5 tube - 3	44.5 X 9.1 SA 213 GR. T22 HFS 1998 WITH ADDENDA 1999No. of Tubes - 320 (80*4), Length - 12 m	Mtr	780	Unit 1 and Unit 2		Y
22	2nd pass	Reheater - 1 tube	44.5 X 3.8 SA 213 GR. T11 HFS 1998 WITH ADDENDA 1999No. of Tubes - 2880 (80*4*18), Length - 11 m	Mtr	1152	Unit 1 and Unit 2		Y

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
23	RTZ area	Tubes in RTZ area - Evaporator tube 1	57.1 X 8.1 SA 210 GR. A1 HFS 1998 WITH ADDENDA 1999	Mtr	1800	Unit 1 and Unit 2		Y
24	Furnace	Insulation	150 mm thickness	mtr2	5000	Unit 1 and Unit 2	Y	
25	Furnace	Corrugated Aluminium coil	1 mm thickness	mtr2	5000	Unit 1 and Unit 2	Y	
26	Refractory	Refractory LHS	LCC 50 refractory	Ton	8.28	Unit 1		Y
27	Refractory	Refractory LHS	LCC 50 refractory	Ton	8.28	Unit 2		Y
28	Refractory	Refractory RHS	LCC 50 refractory	Ton	8.28	Unit 1		Y
29	Refractory	Refractory RHS	LCC 50 refractory	Ton	8.28	Unit 2		Y
30	Refractory	Refractory Rear wall	LCC 50 refractory	Ton	13.3515	Unit 1		Y
31	Refractory	Refractory Rear wall	LCC 50 refractory	Ton	13.3515	Unit 2		Y
32	Refractory	Refractory Front wall	LCC 50 refractory	Ton	13.3515	Unit 1		Y
33	Refractory	Refractory Front wall	LCC 50 refractory	Ton	13.3515	Unit 2		Y
34	2nd Pass	Insulation	100 mm thickness	mtr2	5500	Unit 1 and Unit 2	Y	
35	2nd Pass	Aluminum coil	0.5 mm thickness	mtr2	5500	Unit 1 and Unit 2	Y	
36	Pipelines	Insulation	150 mm and 100 mm thickness	mtr2	4000	Unit 1 and Unit 2	Y	
37	Pipelines	Aluminum coil	0.5 mm thickness	mtr2	4000	Unit 1 and Unit 2	Y	

Plan 5: Cyclone

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
1	Cyclone	Plate	8mm, MS plate Cylindrical	Ton	162	Unit 1 and Unit 2	Y	
2	Cyclone	Plate	8mm Conical area	Ton	52	Unit 1 and Unit 2	Y	
3	Cyclone	Brick lining	Brick lining for cyclone refractory	Nos	80000	Unit 1 and Unit 2	Y	
4	Cyclone	Insulite	REFRACTORY, TATAINCAST INSULITE 11LI GN, MAKE: TATA	Ton	245	Unit 1 and Unit 2	Y	
5	Non- metallic bellow	Cyclone inlet bellow	NMEJ Duct Tag No. EJ-1 Type-KEI FF 25 F, 40XF2W Suitable for degree C, temperature & lignite contain with sulphur drawing No. KE-EN 0209.01 with fastener M 10X50 p70 Nos.	Nos	2	Unit 1 and Unit 2	Y	
6	Non- metallic bellow	Cyclone outlet bellow	NMEJ Cyclone outlet Tag No.EJ-3 Type :F-Fabric combination sulphur , Size:4765mmX8312mm width :500 mm with fasteners	Nos	2	Unit 1 and Unit 2	Y	
7	Refractory	Top Roof	11li for Top Roof	Ton	28.056	Unit 1		Y
8	Refractory	Top Roof	LCC 80 for Top Roof	Ton	52.36	Unit 1		Y
9	Refractory	Top Roof	11li for Top Roof	Ton	28.056	Unit 2		Y
10	Refractory	Top Roof	LCC 80 for Top Roof	Ton	52.36	Unit 2		Y
11	Refractory	Inlet long wall	11li for inlet long wall	Ton	21.6	Unit 1		Y
12	Refractory	Inlet long wall	LCC 80 for inlet long wall	Ton	40.32	Unit 1		Y
13	Refractory	Inlet long wall	11li for inlet long wall	Ton	21.6	Unit 2		Y
14	Refractory	Inlet long wall	LCC 80 for inlet long wall	Ton	40.32	Unit 2		Y
15	Refractory	Inlet short wall	LCC 80 for inlet Short Wall	Ton	26.88	Unit 1		Y
16	Refractory	Inlet short wall	11li for inlet Short Wall	Ton	14.4	Unit 1		Y
17	Refractory	Inlet short wall	LCC 80 for inlet Short Wall	Ton	26.88	Unit 2		Y
18	Refractory	Inlet short wall	11li for inlet Short Wall	Ton	14.4	Unit 2		Y
19	Refractory	Inlet top wall	LCC 80 for inlet top Wall	Ton	26.88	Unit 1		Y
20	Refractory	Inlet top wall	11li for inlet top Wall	Ton	14.4	Unit 1		Y

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
21	Refractory	Inlet top wall	LCC 80 for inlet top Wall	Ton	26.88	Unit 2		Y
22	Refractory	Inlet top wall	11li for inlet top Wall	Ton	14.4	Unit 2		Y
23	Refractory	Mortar (for shell)	Mortar for shell	Ton	2	Unit 1 and Unit 2		Y
24	Refractory	Shell	LCC 80 GN for shell	Ton	10	Unit 1 and Unit 2		Y
25	Refractory	Anchor	Anchor for refractory and vortex	Nos	6000	Unit 1 and Unit 2		Y
26	Refractory	Anchor for furnace	Anchor for furnace	Nos	50000	Unit 1 and Unit 2		Y
27	Refractory	COD	11 li for COD	Ton	9.67	Unit 1		Y
28	Refractory	COD	LCC 80 for COD	Ton	28.22	Unit 1		Y
29	Refractory	COD	11 li for COD	Ton	9.67	Unit 2		Y
30	Refractory	COD	LCC 80 for COD	Ton	28.22	Unit 2		Y
31	Refractory	COD	LCC 80 GN for COD	Ton	20	Unit 1 and Unit 2		Y
32	Refractory	Cyclone outlet	11 li for cyclone outlet	Ton	63.3	Unit 1		Y
33	Refractory	Cyclone outlet	LCC 80 for cyclone outlet	Ton	133.84	Unit 1		Y
34	Refractory	Cyclone outlet	11 li for cyclone outlet	Ton	63.3	Unit 2		Y
35	Refractory	Cyclone outlet	LCC 80 for cyclone outlet	Ton	133.84	Unit 2		Y
36	Refractory	Cyclone downcomer	11 li for cyclone downcomer	Ton	9.8	Unit 1		Y
37	Refractory	Cyclone downcomer	LCC 80 for cyclone downcomer	Ton	33.6	Unit 1		Y
38	Refractory	Cyclone downcomer	11 li for cyclone downcomer	Ton	9.8	Unit 2		Y
39	Refractory	Cyclone downcomer	LCC 80 for cyclone downcomer	Ton	33.6	Unit 2		Y
40	Refractory	Cyclone downcomer	LCC 80 GN for COD	Ton	10	Unit 1 and Unit 2		Y
41	Vortex	Plate	SS310 plate 10mm for shell	Nos	1	Unit 1 and Unit 2	Y	
42	Vortex	Ms plate	Ms plate 8mm for shell	Ton	5	Unit 1 and Unit 2	Y	
43	Vortex	Anchor	Anchor for shell	Nos	1500	Unit 1 and Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
44	Vortex	Vortex Assembly - spares required	VORTEX ASSEMBLY WITH ALL ASSESORIES AS PER DRAWING NO.A U009001-2513 (SHEET 10 OF 4) & DRG NO.A U009001-2516 (SHEET 4 OF 4) FOR CYCLONE(40 SUPPORTS AND CLITS)	Nos	2	Unit 1 and Unit 2	Y	
45	Insulation	Aluminum Sheet	Aluminum Sheet 0.5mm for shell	mtr2	2300	Unit 1 and Unit 2	Y	
46	Insulation	Insulation material (shell)	LIGHT RESIN BONDED ROCK WOOL MATTRESS WITH ONE SIDE GI WIRE MESS OF 20X24 SWG CONFIRMING OF IS 8183 OF DENSITY 150 KG/M3 THICKNESS: 40 MM.	kg	2500	Unit 1 and Unit 2	Y	

Plan 6: Dampers and gates

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
1	ID fan inlet and outlet dampers	Guillotine damper	1. SIZE:3180X3180MM,TYPE OF OPERATION:GUILLOTINE,DRG NO.GSG/8650-02/00, 2. SIZE:3180X3180MM,TYPE OF OPERATION:GUILLOTINE,DRG NO.GSG/8650-02/00	Nos	4	Unit 1 and Unit 2	Y	
2	ID fan inlet and outlet dampers	Seal strip for Damper	Set of seals For 3180X3180 mm isolator, as Drg No. DEG/8650-02/00 MOC:SS 316, thickness :0.25 mm, one set consisting of 1. loop seal straight-16 Nos. 2. Loop seal RH corner -08 Nos.3. Loop seal LH corner -08 Nos. 4. Corner Tensioner-08 Nos.	Nos	8	Unit 1 and Unit 2	Y	
3	PA, SA Control damper	Bearings	FYJ 75 TF SKF MAKE	Nos	16	Unit 1 and Unit 2	Y	
4	PA, SA Control damper	Bearings	FYJ 60 TF SKF MAKE	Nos	24	Unit 1 and Unit 2		
5	Guillotine gates for ID fan	Guillotine gates	3180(H) X 3180(W) X 400(F/F)-ESP OUTLET / ID FAN SUCTION / ID FAN DISCHARGE - DRAWING NO: GSG/8650-02/00	Nos	8	Unit 1 and Unit 2	Y	

Plan 7: Ducts

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
1	Ducts	Insulation (PA, SA and ID)	60 mm and 150 mm thickness	mtr2	4500	Unit 1 and Unit 2	Y	
2	Ducts	Aluminum coil for cladding (PA, SA and ID)	0.5 mm thickness	mtr2	4500	Unit 1 and Unit 2	Y	
3	Duct	ID outlet and suction bellow	1. NMEJ Duct Tag No.K87 Type -F type fabric combination suitable for lignite which containing sulphur. Drawing No.KE.EN0174.02 2. NMEJ Duct Tag No.K85 Type -F type fabric combination suitable for lignite which containing sulphur. Drawing No.KE.EN0174.02	Nos	10	Unit 1 and Unit 2	Y	
4	Duct	Fan duct		Ton (Detailed below)	63.18		Y	
4.1	Duct	PA Fan Duct	MS Plate, Thick:6 mm, Std Size In Tons	Ton	21.06	Unit 1 and Unit 2	Y	
4.2	Duct	SA Fan Duct	MS Plate, Thick:6 mm, Std Size In Tons	Ton	28.08	Unit 1 and Unit 2	Y	
4.3	Duct	ID Fan Duct	MS Plate, Thick:6 mm, Std Size In Tons	Ton	14.04	Unit 1 and Unit 2	Y	

Plan 8: Fans

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
1	Fans	Insulation	60 mm and 150 mm thickness	mtr2	500	Unit 1 and Unit 2	Y	
2	Fans	Aluminum coil for cladding	0.5 mm thickness	mtr2	500	Unit 1 and Unit 2	Y	
3	ID fan	Impeller and shaft	TYPE: BACKWARD CURVED LAMINAR, SIZE &MODEL:2990MM DIBCB-42, TIP SPEED M/S:111.15, SHAFT POWER:718KW, FAN RPM:710, SHAFT DIA AT BEARING:190.5MM,.DIA AT IMPELLER:405MM,MATERIAL:EN 8,BEARING TYPE:JOURNAL SIZE: 190.5",	Nos	1	Unit 1	Y	
4	SA fan	Impeller and shaft	IMPELLER & SHAFT FOR 2030 MM DIA. DI.BAB-11 SA FAN, DRAWING NO. K-4765&PART NO: 3 & 5 IMPELLER SIZE:2030MM, IMPELLER TYPE: BACKWARD CURVED AEROFOILD, SHAFT DIA AT BEARING:101.6 MM, SHAFT DIA AT IMPELLER:290 MM, MODEL: DIBAB-11, MAKE: ANDREW YULE	Nos	1	Unit 1	Y	
5	PA fan	Impeller and shaft	IMPELLER WITH SHAFT ASSEMBLY OF SA FAN, IMPELLER SIZE:2350MM, DRAWING NO. K-4762, IMPELLER TYPE: BACKWARD CURVED AEROFOILD, SHAFT DIA AT BEARING:101.6 MM, SHAFT DIA AT IMPELLER:290 MM, MODEL: DIBAB-11, MAKE: ANDREW YULE	Nos	1	Unit 1	Y	

Plan 9: Hangers and supports

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
1	Hangers and supports	Internal pipeline	Attached in Annexure 4	Nos (per unit)	181	Unit 1 and Unit 2	Y	
2	Hangers and supports	External pipeline	Attached in Annexure 4	Nos (per unit)	294	Unit 1 and Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
3	Hangers and supports	Drain system	Attached in Annexure 4	Nos (per unit)	28	Unit 1 and Unit 2	Y	
4	Hangers and supports	Flue gas ducts	Attached in Annexure 4	Nos (per unit)	28	Unit 1 and Unit 2	Y	
5	Hangers and supports	Cyclone	Attached in Annexure 4	Nos (per unit)	16	Unit 1 and Unit 2	Y	
6	Hangers and supports	Discs at penthouse	DISC TYPE SUPPORT	Nos	1094	Unit 1 and Unit 2	Y	

Plan 12: Lime dosing system

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
1	Bag filter Unit-1	Procurement of bags	Bag Filter, Type-Pulse Jet,Capacity-60000M3/Hr,Filter Bag Type - Pulse Jet, Size-512M1220 Ltr,Application-Bag Filter	Nos	100	Unit 1	Y	
2	Lime screw pump for Unit #1	Procurement of bearings	Bearing 7328 BCBM, Make:SKF	Nos	4	Unit 1	Y	
3	Compressor-1B	Procurement of spares		Lot (defined below)	1	Unit 1	Y	
3.1	Compressor-1B	Back End Cover	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 1	Y	
3.2	Compressor-1B	Cylinder	Cylinder 350mm dia. Part No. 35180511, Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 1	Y	
3.3	Compressor-1B	Cylinder Water Jacket Cover	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 1	Y	
3.4	Compressor-1B	Cylinder Water Jacket Gasket	Model No.1HA4Q, Make- KG KHOSLA	Nos	8	Unit 1	Y	
3.5	Compressor-1B	Ovel Flange Stud Suction	Model No.1HA4Q, Make- KG KHOSLA	Nos	40	Unit 1	Y	
3.6	Compressor-1B	Ovel Flange Nut Hexsuction	Model No.1HA4Q, Make- KG KHOSLA	Nos	80	Unit 1	Y	
3.7	Compressor-1B	Gasket	GASKET 24442760 FOR AIR COMP.KIR. 1HA 4Q	Nos	8	Unit 1	Y	
3.8	Compressor-1B	Cover Front End	COVER FRONT END PART NO.35165130	Nos	4	Unit 1	Y	
3.9	Compressor-1B	Gasket	GASKET 24445400 FOR AIR COMP.KIR. 1HA 4Q	Nos	4	Unit 1	Y	
3.10	Compressor-1B	Cover Inspection	COVER FRONT END (COVER PROTION) PART NO.35164961	Nos	4	Unit 1	Y	
3.11	Compressor-1B	Bush Carrier	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 1	Y	
3.12	Compressor-1B	Discharge Valve Assembly	Model No.1HA4Q, Make- KG KHOSLA	Nos	32	Unit 1	Y	
3.13	Compressor-	Front End Cover	Model No.1HA4Q, Make- KG KHOSLA	Nos	80	Unit 1	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
	1B	Stud						
3.14	Compressor-1B	Front End Cove Hex Nut	Model No.1HA4Q, Make- KG KHOSLA	Nos	192	Unit 1	Y	
3.15	Compressor-1B	Water Jacket Cover Stud	Model No.1HA4Q, Make- KG KHOSLA	Nos	80	Unit 1	Y	
3.16	Compressor-1B	Water Jacket Cover Washer	Model No.1HA4Q, Make- KG KHOSLA	Nos	80	Unit 1	Y	
3.17	Compressor-1B	Ovel Flange Gasket	Model No.1HA4Q, Make- KG KHOSLA	Nos	12	Unit 1	Y	
3.18	Compressor-1B	Flange Ovel	Model No.1HA4Q, Make- KG KHOSLA	Nos	12	Unit 1	Y	
3.19	Compressor-1B	Ovel Flange Stud Bottom	Model No.1HA4Q, Make- KG KHOSLA	Nos	40	Unit 1	Y	
3.20	Compressor-1B	Back End Cover To Cylinder	Model No.1HA4Q, Make- KG KHOSLA	Nos	80	Unit 1	Y	
3.21	Compressor-1B	Cover Seal	COVER SEAL PART NO.35162540 ,Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 1	Y	
3.22	Compressor-1B	Nut Hex	NUT HEX PN 22072160, Model No.1HA4Q, Make- KG KHOSLA	Nos	16	Unit 1	Y	
3.23	Compressor-1B	Stud	STUD, CODE : 2222846000 , KHOSLA MAKE	Nos	16	Unit 1	Y	
3.24	Compressor-1B	Nut Lock	NUT LOCK HEX PN 22058150,Model No.1HA4Q, Make- KG KHOSLA	Nos	16	Unit 1	Y	
3.25	Compressor-1B	Ovel Flange Suction	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 1	Y	
3.26	Compressor-1B	Back End Cover Installation	Model No.1HA4Q, Make- KG KHOSLA	Nos	32	Unit 1	Y	
3.27	Compressor-1B	Suction Valve Assembly	VALVE SUC S/A 35050280 FOR KIRLOSHKER AIR COMPRESSOR	Nos	32	Unit 1	Y	
3.28	Compressor-1B	Ring Packing Gland	RING GLAND PACKING PART NO. 35296041, Model No.1HA4Q, Make- KG KHOSLA	Nos	40	Unit 1	Y	
3.29	Compressor-1B	S/A Piston 350 ϕ (2 Nos. Piston Half, 2 Nos. Piston Ring, Piston Rod,Nut Hex, Washer Disk, Nut Blocking)	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 1	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
3.30	Compressor-1B	Gasket	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 1	Y	
3.31	Compressor-1B	Valve Delivery 134 Cr-2	S/A VALVE DELIVERY, CODE : 3606038000, KHOSLA MAKE	Nos	4	Unit 1	Y	
3.32	Compressor-1B	Ring Holding	RING HOLDING PART NO. 36290060	Nos	4	Unit 1	Y	
3.33	Compressor-1B	Valve Safety S/A	MODEL NO - 1HA4Q	Nos	1	Unit 1	Y	
3.34	Compressor-1B	Indicator Water Flow S/A	INDICATOR WATER FLOW S/A, PART NO. 35271220 AND PART NO. 35271151	Nos	5	Unit 1	Y	
3.35	Compressor-1B	Filter Air S/A With Silencer	Element Filter Air Part No. 36190320	Nos	2	Unit 1	Y	
3.36	Compressor-1B	V Belt Spc	Type 6300	Nos	7	Unit 1	Y	
3.37	Compressor-1B	Cylinder Lubricator With Lubricator Pump, Dish Tubing With Necessary Fittings	Model No-1Ha4Q	Nos	1	Unit 1	Y	
3.38	Compressor-1B	Oil Filter With Body	Model No.1HA4Q, Make- KG KHOSLA	Nos	1	Unit 1	Y	
4	Compressor belt	Procurement of belts	V-BELT SPC TYPE 6300	Nos	14	Unit 1	Y	
5.1	Mill ball	Procurement of Mill ball	40mm	Ton	5	Unit 1	Y	
5.2	Mill ball	Procurement of Mill ball	50mm	Ton	5	Unit 1	Y	
5.3	Mill ball	Procurement of Mill ball	60mm	Ton	5	Unit 1	Y	
6	Lvalve	Procurement of ball	Ball ON-OFF valve, Soize-200 mm, 84F2, MOC-WCB/SS 304 (CF*)/PTFE Pneumatic operated , Make-Micro Finish,	Nos	2	Unit 1	Y	
7	Compressor NRV	Procurement of NRV	NRV, Model No. 1HA4Q	Nos	4	Unit 1	Y	
8	Lubricant	Procurement of oil for DE/NDE bearing	Servo Mesh Sp-320,Make-IOCL	Ltr	1000	Unit 1 and Unit 2	Y	
9	Miscellaneous		Installation and service of spares	Lot	1	Unit 1	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
10	Lime mill-2 main gear box coupling	Procurement of spare coupling		Set (As defined below)	1		Y	
10.1	Lime mill-2 main gear box coupling	Gear Coupling	Afg-106, Bore Size Motor Side-140Mm,Gear Box-110Mm, Key Way Size Motor Side-34X10Mm	Nos	1	Unit 2	Y	
10.2	Lime mill-2 main gear box coupling	Gear Box Side	28X8Mm,Appliation For Lime Mill	Nos	1	Unit 2	Y	
11	Chain conveyor unit-2	Chain Link Assembly	(One Set Consist Of 04 Nos.Link ,01 Flight , Connecting Pin & Circlip), Chain Pitch-142Mm,Speed-0.15Mtr/Sec, Capacity-90T/Hr,Moc-Low Alloy Steel, 20Mncr5,Forged,60 Hrc For Lime Chain Conveyor, Make-Enviro Abrasion Resistant Engineering Pvt.Ltd.	Set	150	Unit 2	Y	
12	Chain conveyor Unit-2	Procurement of spare guide plate	Bottom wea Strip (Sail Hard), Part No. MH-027-1A-BWS, Make- Enviro Bulkk Handling System Pvt. Ltd, (Drawing MH-027-15-A-001 Rev-00)	Mtr	60	Unit 2	Y	
13	DE/NDE pump Unit-2	Procurement of spare pump	Type Of Pump-Gear,Capacity-20Lpm,Inlet Pressure-0.5Kg/Cm2,Discharge Pressure-8 Kg/Cm2,Application-Lop De And Nde Side,Make-Dowty	Nos	2	Unit 2	Y	
14	Main gearbox pump Unit-2	Procurement of spare pump	Type Of Pump-Gear,Capacity-75Lmp,Inlet Pressure-0.5Kg/Cme , Discharge Pressure-5 Kg/Cm2,Connection Size-1.25"Bsp, Make-Sunrise Engineering	Nos	1	Unit 2	Y	
15	Bag filter Unit-2	Procurement of bags	Bag Filter,Type-Pulse Jet,Capacity-60000M3/Hr,Filter Bag Type - Pulse Jet, Size-512M1220 Ltr,Application-Bag Filter	Nos	100	Unit 2	Y	
16	Bag filter Unit-2	Procurement of bags with retainer	Bag Filter Cage,Type-Pulse Jet,Capacity-60000M3/Hr,Filter Bag Type - Pulse Jet, Size-512M1220 Ltr, Application-Bag Filter	Nos	50	Unit 2	Y	
17	Dilution	Procurement of	Spa 2800,Make-Fenner	Nos	3	Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
	blower Unit-2	belts						
18	Screw pump Unit-2	Procurement of spare	Barrel Assembly For Screw Pump, Model No. 235 Mm Pneumatic Pump	Nos	1	Unit 2	Y	
19	Compressor-2A	Procurement of spares		Lot (as defined below)	1	Unit 2	Y	
19.1	Compressor-2A	Back End Cover	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 2	Y	
19.2	Compressor-2A	Cylinder	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 2	Y	
19.3	Compressor-2A	Cylinder Water Jacket Cover	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 2	Y	
19.4	Compressor-2A	Cylinder Water Jacket Gasket	Model No.1HA4Q, Make- KG KHOSLA	Nos	8	Unit 2	Y	
19.5	Compressor-2A	Ovel Flange Stud Suction	Model No.1HA4Q, Make- KG KHOSLA	Nos	40	Unit 2	Y	
19.6	Compressor-2A	Ovel Flange Nut Hexsuction	Model No.1HA4Q, Make- KG KHOSLA	Nos	80	Unit 2	Y	
19.7	Compressor-2A	Gasket	Model No.1HA4Q, Make- KG KHOSLA	Nos	8	Unit 2	Y	
19.8	Compressor-2A	Cover Front End	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 2	Y	
19.9	Compressor-2A	Gasket	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 2	Y	
19.10	Compressor-2A	Cover Inspection	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 2	Y	
19.11	Compressor-2A	Bush Carrier	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 2	Y	
19.12	Compressor-2A	Discharge Valve Assembly	Model No.1HA4Q, Make- KG KHOSLA	Nos	32	Unit 2	Y	
19.13	Compressor-2A	Front End Cover Stud	Model No.1HA4Q, Make- KG KHOSLA	Nos	80	Unit 2	Y	
19.14	Compressor-2A	Front End Cove Hex Nut	Model No.1HA4Q, Make- KG KHOSLA	Nos	192	Unit 2	Y	
19.15	Compressor-2A	Water Jacket Cover Stud	Model No.1HA4Q, Make- KG KHOSLA	Nos	80	Unit 2	Y	
19.16	Compressor-2A	Water Jacket Cover Washer	Model No.1HA4Q, Make- KG KHOSLA	Nos	80	Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
19.17	Compressor-2A	Ovel Flange Gasket	Model No.1HA4Q, Make- KG KHOSLA	Nos	12	Unit 2	Y	
19.18	Compressor-2A	Flange Ovel	Model No.1HA4Q, Make- KG KHOSLA	Nos	12	Unit 2	Y	
19.19	Compressor-2A	Ovel Flange Stud Bottom	Model No.1HA4Q, Make- KG KHOSLA	Nos	40	Unit 2	Y	
19.20	Compressor-2A	Back End Cover To Cylinder	Model No.1HA4Q, Make- KG KHOSLA	Nos	80	Unit 2	Y	
19.21	Compressor-2A	Cover Seal	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 2	Y	
19.22	Compressor-2A	Nut Hex	Model No.1HA4Q, Make- KG KHOSLA	Nos	16	Unit 2	Y	
19.23	Compressor-2A	Stud	Model No.1HA4Q, Make- KG KHOSLA	Nos	16	Unit 2	Y	
19.24	Compressor-2A	Nut Lock	Model No.1HA4Q, Make- KG KHOSLA	Nos	16	Unit 2	Y	
19.25	Compressor-2A	Ovel Flange Suction	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 2	Y	
19.26	Compressor-2A	Back End Cover Installation	Model No.1HA4Q, Make- KG KHOSLA	Nos	32	Unit 2	Y	
19.27	Compressor-2A	Suction Valve Assembly	Model No.1HA4Q, Make- KG KHOSLA	Nos	32	Unit 2	Y	
19.28	Compressor-2A	Ring Packing Gland	Model No.1HA4Q, Make- KG KHOSLA	Nos	40	Unit 2	Y	
19.29	Compressor-2A	S/A Piston 350 ϕ (2 Nos. Piston Half, 2 Nos. Piston Ring, Piston Rod,Nut Hex, Washer Disk, Nut Blocking)	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 2	Y	
19.30	Compressor-2A	Gasket	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 2	Y	
19.31	Compressor-2A	Valve Delivery 134 Cr-2	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 2	Y	
19.32	Compressor-2A	Ring Holding	Model No.1HA4Q, Make- KG KHOSLA	Nos	4	Unit 2	Y	
19.33	Compressor-2A	Indicator Water Flow	S/A 3/4"	Nos	5	Unit 2	Y	
19.34	Compressor-2A	Filter Air S/A With Silencer	Model No.1HA4Q, Make- KG KHOSLA	Nos	2	Unit 2	Y	
19.35	Compressor-	V Belt Spc	Type 6300	Nos	7	Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
	2A							
19.36	Compressor-2A	Cylinder Lubricator With Lubricator Pump, Dish Tubing With Necessary Fittings for Model No-1Ha4Q	Model No.1HA4Q, Make- KG KHOSLA	Nos	1	Unit 2	Y	
19.37	Compressor-2A	Oil Filter With Body	Model No.1HA4Q, Make- KG KHOSLA	Nos	1	Unit 2	Y	
20	Compressor belt	Procurement of belts	SPC 6300	Nos	14		Y	
21	HAG burner Unit-2	Procurement of spare gun	Oil Gun Assembly, Model No. 1Tj. Ref. Drawing 01948-01-B12	Nos	1	Unit 2	Y	
22	Ball valve Unit- 2	Procurement of ball	Microfinish Make Ball On-Off Valve ,Size -200 Mm 84F2 Moc : WCB/Ss 304(CF8) /PTFE Pneumatic Operated.	Nos	2	Unit 2	Y	
23	Compressor NRV	Procurement of NRV	NRV, Model No. 1HA4Q, MAKE- KG KHOSLA	Nos	4	Unit 1 and Unit 2	Y	
24	Miscellaneous		Installation and service of spares	Lot	1	Unit 2	Y	
25	Lime compressor	Lime conveying system compressor	Model No.1HA4Q, Make- KG KHOSLA	Nos	1	Unit 2	Y	
26	Bag filter compressor Unit-2	Procurement of spare	Model No. GA18, Make-Atlas Copco as per annexure Lime Mill Bag Filter Compressor	Lot (detailed below)	1	Unit 2	Y	
26.01	Compressor	Air Filter Element	Model No. 1613872000, Make - Atlas Copco	Nos	02	Unit 2	Y	
26.02	Compressor	Oil Filter Element	Model No. 1613610590, Make - Atlas Copco	Nos	02	Unit 2	Y	
26.03	Compressor	Gear Wheel	Model No. 1622002300, Make - Atlas Copco	Nos	01	Unit 2	Y	
26.04	Compressor	Gear Pinion	Model No. 1622002300, Make - Atlas Copco	Nos	01	Unit 2	Y	
26.05	Compressor	Motor Mounting Spacer	Model No. 1622001200, Make - Atlas Copco	Nos	02	Unit 2	Y	
26.06	Compressor	Hexagona Bolt	Model No. 0147137603, Make - Atlas Copco	Nos	02	Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
26.07	Compressor	Anti Vibration Pad	Model No. 1613675216, Make - Atlas Copco	Nos	02	Unit 2	Y	
26.08	Compressor	Receiver Tank Damper	Model No. 2235254400, Make - Atlas Copco	Nos	08	Unit 2	Y	
26.09	Compressor	Solenoid Valve	Model No. 1089062114, Make - Atlas Copco	Nos	02	Unit 2	Y	
26.10	Compressor	Elektronikon Display	Model No. 19000171012, Make - Atlas Copco	Nos	01	Unit 2	Y	
26.11	Compressor	Temp.Sensor	Model No. 1089057407, Make - Atlas Copco	Nos	01	Unit 2	Y	
26.12	Compressor	Wire Harness	Model No. 1622000513, Make - Atlas Copco	Nos	02	Unit 2	Y	
26.13	Compressor	Pressure Transducer	Model No. 1089057551, Make - Atlas Copco	Nos	01	Unit 2	Y	
26.14	Compressor	Unloading Valve Repair Kit	Model No. 2901000201, Make - Atlas Copco	Nos	02	Unit 2	Y	
26.15	Compressor	Min. Press. Valve Repair Kit.	Model No. 2901006500, Make - Atlas Copco	Nos	02	Unit 2	Y	
26.16	Compressor	Thermostat Valve Kit.	Model No. 1619733300, Make - Atlas Copco	Nos	02	Unit 2	Y	
26.17	Compressor	Element Oil Separator	Model No. 2901077901, Make - Atlas Copco	Nos	02	Unit 2	Y	
26.18	Compressor	Oil Roto Inject	Model No. 2901052200 20-Ltr Pack, Make - Atlas Copco	Nos	3	Unit 2	Y	
26.19	Compressor	Seal Ring Kit	Model No. 1616574200, Make - Atlas Copco	Nos	02	Unit 2	Y	

Plan 13: Pumps

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
1	Hot Water Pump	Hot water pump motor	69 KW	Nos	2	Unit 1 and Unit 2	Y	

Plan 14: TAPH

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
1	TAPH	Tubes	Tubes for 12 Blocks	Nos	29952	Unit 1 and Unit 2	Y	
2	TAPH	SS Plate	1. 80mm, heavy duty Pipe MS 2. 3mm Plate SS 304 for Bellow	Ton	5	Unit 1 and Unit 2	Y	
3	TAPH	Insulation	80 mm and 150 mm thickness insulation	mtr2	2880	Unit 1 and Unit 2	Y	
4	TAPH & PA duct inlet bellow	Aluminum coil	0.5 mm thickness Aluminum coil for cladding	mtr2	2880	Unit 1 and Unit 2	Y	

Plan 16: Electrical

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
1	Heat tracing ckt cable	FOPH Heat Tracing Ckt :- 1,2,3,4,15,16,17,18,21,22,27	Thermon self limitting heater TSX-12 240V AC 12W/FT 40W/M Heat Tracing cable 7mmx5mm	Mtr	1000	Unit 1 and Unit 2	Y	
2	FA fan	FA fan cooling fan with motor	FA Fan cooling fan with motor,Type HOD 015/2 TK,Kw .350,rpm 2720,volt 415v,3 phase, FLC 1.14A, Cosphi-.70, 50Hz,Ref.Sr no 140313516, Make -HELLOS VENTILATOREN, 780 56 villingen (German) or any equipment	Nos	4	Unit 1 and Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
3	Lignite Rotary Feeder	Lignite rotary feeder spare motor	Lignite Rotary Feeder Motor :- 3-ø, Type: - KF77 DV 132 ML- 4, TECH IP-55, RPM 1440/91, Amb -SF, KW: - 9.2/s1 VOL: - 240 Delta /415 Star/ Amp. 30/17.5, Hz 50, P.F 0.84, Mounting: Flange Mounting, CEIM: M1A, Ins Class H, Heating Volt: - 240v/AT, Duty: - s1, MAX 80 GRAD C/7016 4 KTR Lubricant CLP PG 220 SYNTH OIL, S.20 LTR/.8 LTR, Make: - SEW EURO DRIVE BRUCHSAL GERMANY,ALSTOM, MARATHON (One To One Replacement)	Nos	2	Unit 1 and Unit 2	Y	
4	Soot Blower Motor	Soot Blower Motor		Lot	1	Unit 1 and Unit 2	Y	
5	TAPH	Soot blower Motors	TAPH Soot Blower Motor :- 3-ø Motor, Sr No N2120639, Frame Size MA071434, Voltage 415, Amp 0 .5, Kw 0.25, RPM 1380, Mounting Flange, Make:- Bharat Bijlee,ALSTOM, MARATHON	Nos	12		Y	
6	Second Pass	Soot blower Motors	Second Pass Soot Blower Motor:- 3-ø Motor , Sr No K5117282 ,Frame Size 90L,Voltage 415,RPM 1416, Kw 1.1, Amp 2.5, Mounting Flange, Make :-Bharat Bijlee, ALSTOM, MARATHON	Nos	6		Y	
7	Start up Inching MOV	Start up Inching MOV actuator	Start up Inching MOV Auma Make atuator:- Make Auma india, Commission no 659031447,Actuator type SAR 12ASA2-82, enclosure IP67,closing torque min/max 60-120 Nm,opening tourque min/max 60-120 Nm Speed 1/min 32, lubracant EP0 tag no ,auma (indai) lte, Bangalore 560058	Nos	1	Unit 1	Y	
8	FOPH	FOPH axial exhaust fan	Axial Exhaust fan motor :- 3-ø,Sr no. C804, KW 240watt, 0.5amps, 700rpm, 50Hz, Make :- Khaitan	Nos	2	Common	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
9	FOPH	FOPH axial exhaust fan	Axial exhaust fan:- Phase-3,Volts-415,RPM-1415,KW-1.1,4Pole,HZ-50,FRAME NO-ND905,MAKE-Crompton Graves	Nos	3	Common	Y	
10	LMCC	LMCC axial exhaust fan	Axial exhaust fan:- Phase-3,Volts-415,RPM-1410KW-0.75,4Pole,HZ-50,FRAME NO-SD80,MAKE-Crompton Graves	Nos	4	Common	Y	

Plan 17: C&I

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
1	Gravimetric feeder-2A	Load cell	LOAD CELL ACCESSORIES (DRAGLINK ACCESSORIES), STOCK OR EQUIVALENT	Nos	2	Unit 2	Y	
2	Gravimetric feeder	Speed sensor	SPEED SENSOR FOR STOCK GRAVIMETRIC FEEDER LPG32, STOCK PART NO.: FE13045,MAKE: STOCK EQUIPMENT COMPANY	Nos	2	Unit 1 and 2	Y	
3	Ash cooler phe	PHE temp control valve positioner	ELECTROPNEUMATIC POSITIONER, TYPE:2 WIRE SINGLE ACTING, MODEL: 6DR5010-ONG00-0AA0, INPUT: 4 TO 20 MADC, OUTPUT: 3 TO 15 PSI, SUPPLY: 1.4 TO 7BAR, PNEUMATIC CONNETION:G1/4", ELECTRICAL CONNECTION:M20X1.5, WEATHERPROOF IP65MAKE: SIEMENS WITH FEEDBACK CARD	Nos	2	Unit 1 and Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
4	Lignite draglink	Lignite draglink conveyor speed sensor	ENCODER FOR SPEED MEASUREMENT, MODEL NO.:RO-0360-I24/N1U, ID. NR. 315 161-06, RO6343, SUPPLY 10V…30 VDC / 360 PULSES EQUIVALENT NO.: 10 659 727A , MAKE: IFM ELECTRONICS, APPLICATION: LIGNITE DRAGLINK	Nos	2	Unit 1 and Unit 2	Y	
5	TAPH	Thermocouple	THERMOCOUPLE, TYPE: MINERAL INSULATED DUPLEX K- TYPE, CLASS II AS PER IEC 584, WITH 2.8MM DIA INCONEL 600 SHEATH. OPEN END PROVIDED WITH A CRIMP ON POT & PTFE INSULATION LEAD WIRES, 7X0.2MM, INDIVIDUALLY & OVERALL PTFE INSULATED,AND SS FLEXHOSE, LENGTH: 5MTR, UNGROUNDED HOT JUNCTION, PROCESS CONNECTION:1/2"NPT(M),ROUTE LENGTH RL=5000MM, LEAD WIRE LENGTH: 5000MM,CODE: 100 SERIES 2-K-2.8-INC 600-CJT 201-RL-B-P-OP 30, MAKE: PYROELECTRIC ,GOA/ EQUIVALENT	Nos	20	Unit 1 and Unit 2	Y	
6	Control valve	Control Valve (Reheater and superheater valve)	PROXIMITY SWITCH FOR POSITION TRANSMITTER MODEL RMGPSCAM-2090150, MAKE:RMG	Nos	10	Unit 1 and 2	Y	
7	Control valve	Gland sealing and BFP RC control valve	INTELLIGENT POSITIONER , MODEL NO : TZID-C , TYPE : VI 8345- 101021001,SR. NO : 527824, SUPPLY PRESSURE : 1.4 TO 6 BAR, INPUT : 4 - 20 MA, MAKE: ABB WITH FEEDBACK CARD	Nos	5	Unit 1 and 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
8	PRDS station	PRDS high pressure side pressure and BFP discharge pressure transmitter.	PRESSURE TRANSMITTER , MODEL: EJA440E-JCS5J-912EB , MEASUREMENT SPAN : 50 to 320 BAR , MAKE : YOKOGAWA	Nos	4	Unit 1 and 2	Y	
9	FRS station	FRS DP transmitter	PRESSURE TRANSMITTER , MODEL:EJA110E-JVS5J-912EB/HG , MEASUREMENT SPAN: 1.4 to 140 BAR , MWP: 25 MPA , MAKE : YOKOGAWA	Nos	6	Unit 2	Y	
10	Feed water and steam flow	Feed water and steam flow transmitter	DP TRANSMITTER , MODEL: EJA110E-JMS5J-912EB, MEASUREMENT SPAN: 100 to 10000 MMH20 ,MWP: 16 MPA,MAKE : YOKOGAWA, Cal Range: 0 to 10000 mmh2o	Nos	6	Unit 2	Y	
11	Control valve	SH & RH attemperator control valve positioner	ELECTRO PNEUMATIC POSITIONER 3582 I POSITIONER ASSEMBLY ITEM CODE:FS3582I - 139-G1 PART NO.:P/N FS35821-53-G1 INPUT SIGNAL:4-20MA DC ACTION DIRECT OUTPUT SIGNAL:6-30PSIG NOMINAL O/P 0-33 ACTUAL TRAVEL RANGE:GREATER THAN 0-2 1/8 INCH SUPPLY GUAGE:0-60 PSIG/0-4 KG CM2 O/P GUAGES:0-60 PSIG/ 0-4 KG/CM2 HAZARDUS AREA APPROVAL ATEX/LCIE IS APPROVAL CAM A	Nos	5	Unit 1 and Unit 2	Y	
12	IGV	Seal kit for ID fan IGV cylinder	SEAL KIT FOR PNEUMATIC ACTUATOR ,SPECIFICATION:MAKE:EL-O-MATIC,MODEL NO:PD280,FAIL OPEN,SR. NO.:5398,5396 , APPLICATION:ID FAN IGV.	Nos	4	Unit 1 and Unit 2	Y	
13	IGV	IGV Cylinder for SA fan IGV	PNEUMATIC ACTUATORS, TYPE : DOUBLE ACTING, MODEL NO.: PD2500, FAIL OPEN, EQUIVALENT SR. NO.:761 & 762, APPLICATION: SA FAN IGV, MAKE: EL O MATIC	Nos	4	Unit 1 and Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
14	IGV	Seal kit for PA fan IGV cylinder	SEAL KIT FOR PNEUMATIC ACTUATOR ,SPECIFICATION:MAKE:EL-O-MATIC,MODEL NO:PD4000,FAIL OPEN,SR. NO.:366,367 , APPLICATION:PA FAN IGV.	Nos	4	Unit 1 and Unit 2	Y	
15	IGV	IGV Cylinder for ID fan IGV	PNEUMATIC ACTUATORS, TYPE : DOUBLE ACTING, MODEL NO.: PD280, FAIL OPEN, EQUIVALENT SR. NO.:5398 & 5396, APPLICATION: ID FAN IGV, MAKE: EL O MATIC	Nos	4	Unit 1 and Unit 2	Y	
16	IGV	Seal kit for SA fan IGV cylinder	SEAL KIT FOR PNEUMATIC ACTUATOR ,SPECIFICATION: MAKE:EL-O-MATIC,MODEL NO:PD2500,FAIL OPEN,SR. NO.:761,762 , APPLICATION:SA FAN IGV.	Nos	4	Unit 1 and Unit 2	Y	
17	IGV	IGV Cylinder for PA fan	PNEUMATIC ACTUATORS, TYPE : DOUBLE ACTING, MODEL NO.: PD4000, FAIL OPEN, EQUIVALENT SR. NO.:366 & 367, APPLICATION: PA FAN IGV, MAKE: EL O MATIC	Nos	4	Unit 1 and Unit 2	Y	
18	Control valve	SH & RH attemperator control valve I/P	I/P CONVERTOR MODEL TEI P11 18311-0-1822101 INPUT SIGNAL :4-20 MADC, OUTPUT: 3 TO 15 PSI, CONNECTION: 1/4"NPT(F) ,IP: 65, CHARACTERISTIC : LINEAR,ACCURACY : +/- 0.5%,AMBIENT TEMP. EFFECT : < 0.05%/K, ZERO & SPAN, DEAD BAND: +/- 0.5%, CABLE ENTRY:1/2"NPT(F), ENCLOSURE: DIE CAST ALU, AIR CONSUMPTION: 0.1SCFM, AIR CAPACITY:2.4SCFM, VIBRATION:1%UP TO 10G, FREQUENCY 10 TO 80 Hz, RESPONSE SENSITIVITY: -20 TO 85 DEG C, AMBIENT TEMP EFFECT: <0.05%/K, ZERO 7 SPAN, MAKE: ABB	Nos	10	Unit 1 and Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
19	Ash Cooler valve	Ash Cooler valve 156 cylinder	PNEUMATIC POWER CYLINDER MODEL NO. TSA/8080/M/200/UF, MAKE:NORGEN., 156 valve	Nos	4	Unit 1 and Unit 2	Y	
20	Ash Cooler valve	Ash Cooler valve 152 cylinder	PNEUMATIC POWER CYLINDER, MODEL NO. TSA/8100/M/300/UF, MAKE:NORGEN`, for 152 valve	Nos	4	Unit 1 and Unit 2	Y	
21	Ash Cooler valve	Ash Cooler valve 152 cylinder seal kit	SEAL KIT FOR PNEUMATIC POWER CYLINDER , MODEL: TSA/8100/00, MAKE: NORGREN	Nos	4	Unit 1 and Unit 2	Y	
22	Ash Cooler valve	Ash Cooler valve 156 cylinder seal kit	SEAL KIT FOR PNEUMATIC POWER CYLINDER , MODEL: TSA/8080/00, MAKE:NORGREN	Nos	4	Unit 1 and Unit 2	Y	
23	ID fan	ID Fan scoop positioner	PNEUMATIC POSITIONER FOR POWER CYLINDER MODEL - HTP ,POSITIONER MODEL: PCP001, MAKE: INSTRUMENTATION LTD.	Nos	4	Unit 1 and Unit 2	Y	
24	Bed Material Feeding System Valve	Bed Material Feeding System Valve Passing Seal Kit	SEAL KIT FOR PNEUMATIC CYLINDER MODEL: RA/8200/320/SER.B.,Q-200 mm --- 320MM 83DD, P 1-16 BAR, TMAX 80 DEG C MAKE: NORGREN APPLICATION : BED MATERIAL FEEDING SYSTEM VALVE	Nos	1	Unit 1 and Unit 2	Y	
25	Furnace	Pressure Transmitter	PRESSURE TRANSMITTER, RANGE : 0 TO 10 BAR R, CODE: 51GB295B312112, SUPPLY : 12 TO 24 VDC, OUTPUT: 4 TO 20 MA DC, CABLE LENGTH:- 3 METER,TRANSMITTER CONNECTION:1/2:NPT(M), MOUNTING: DIRECT,MAKE : ABB	Nos	4	Unit 1 and 2	Y	
26	Drum and Main steam Pressure	Drum Pressure and main steam pressure transmitter	PRESSURE TRANSMITTER , MODEL: EJA440E-JCS5J-912EB , MEASUREMENT SPAN : 50 to 320 BAR , MAKE : YOKOGAWA	Nos	4	Unit 1 and 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
27	Burner system	Burner 1 igniter SOV	SOLENOID VALVE WITH COIL, MODEL: MFH/VL-5-1/815E6 (MFH5-1/8), CHAPTER ID - 84799090, PART NO. - 9982 CONNECTION : 1/8" BSP (F), COIL VOLTAGE : 24VDC, 4.5W, COIL MODEL : MSFG-24/42-50/60, 4527, MAKE : FESTO	Nos	20	Unit 1 and 2	Y	
28	Burner system	Igniter cylinder	AIR CYLINDER 600 MM EXPANSION, MODEL NO.:D-VE-562-11/024DC/N, SUPPLY:24WDC/6VA, IP 65, TEMP : -5 TO 50 DEG 'C, APPLICATION : IGNITOR ROD, MAKE : DURAG	Nos	2	Unit 1 and 2	Y	
29	Burner system	Igniter cylinder seal kit	GASKET KIT FOR RETRACTION UNIT, MODEL : D VE-562-11/024DC/N, PART NO : BVE500DI, MAKE DURAG	Nos	5	Unit 1 and 2	Y	
30	Burner system	Oil gun cylinder	SEAL KIT FOR OILGUN CYLINDER	Nos	5	Unit 1 and 2	Y	
31	Burner system	Oil gun cylinder seal kit	UNIVERSAL CYLINDER, MODEL NO.: DUJ 80/400 ,J 111000 / 800400, APPLICATION: BURNER OIL GUN MAKE: JOYNER	Nos	5	Unit 1 and 2	Y	
32	Burner system	Burner 1 oil gun SOV	SOLENOID VALVES, MODEL NO : 9601430082702400, VOLTAGE : 24 VDC, MAKE: NORGREN	Nos	20	Unit 1 and 2	Y	
33	Burner system	Burner 1 oil valve SOV	SOLENOID VALVES, MODEL NO : 0000000 303202400, MAKE: NORGREN	Nos	20	Unit 1 and 2	Y	
34	Burner system	Burner 1 steam valve SOV	SOLENOID VALVE , MODEL :2622200.0000.000.00, MAKE: NORGREN	Nos	20	Unit 1 and 2	Y	
35	Burner system	Ignitor	DURAG MAKE HIGH ENERGY IGNITION DEVICE, MODEL: D-HG 500-50-C-230 WITH 3.0M CABLE ,POWER SUPPLY: 230 VAC	Nos	4	Unit 1 and 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
36	Burner system	Ignitor tips	HIGH TEMP IGNITOR TIP , LENGTH: 593MM ,MODEL : BHG 400 ZUNDSPHT , HIGH TEMPERATURE VERSION UP TO 1000 DEG C, MAKE: DURAG/DYNAMIC ENGNEERING WITH SR. NO. MUST BE ENGRAVED ON THE BODY OF THE TIP.	Nos	10	Unit 1 and 2	Y	
37	Burner system	Burner 8 gas flame scanner	IR FLAME SCANNER, OPERATIONAL MODE: CONTINUES ENCLOSURE G, AXIAL PPLUG TYPE M1, MODEL: D-LE 603 UA, PROTECTION CLASS:IP67, 1.5MTR. SILICON CABLE FOR BURNERS, APPLICATION: SUITABLE FOR LPG GAS, OIL AND LIGNITE, MAKE- DURAG.	Nos	1	Unit 2	Y	
38	Burner system	HFO flame scanner	IR FLAME SCANNER WITH SPECTRAL RANGE 300-1100NM, ENCLOSURE G, AXIAL PPLUG TYPE M1, MODEL: D-LE 603 IS - P, PROTECTION CLASS:IP67, 1.5MTR. SILICON CABLE FOR BURNERS, MAKE- DURAG.	Nos	6	Unit 1 and 2	Y	
39	Burner system	HFO flame scanner	ELECTROPNEUMATIC POSITIONER, TYPE:2 WIRE DOUBLE ACTING, MODEL: 6DR5020-ONG00-0AA0, INPUT: 4 TO 20 MADC, OUTPUT: 3 TO 15 PSI, SUPPLY: 1.4 TO 7BAR, PNEUMATIC CONNETION:G1/4", ELECTRICAL CONNECTION:M20X1.5, WEATHERPROOF IP65MAKE: SIEMENS WITH FEEDBACK CARD	Nos	5	Unit 1 and 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
40	Damper spare	Burner-6, Ash cooler flow control damper positioner	ELECTROPNEUMATIC POSITIONER, TYPE:2 WIRE DOUBLE ACTING, MODEL: 6DR5020-ONG00-0AA0, INPUT: 4 TO 20 MADC, OUTPUT: 3 TO 15 PSI, SUPPLY: 1.4 TO 7BAR, PNEUMATIC CONNETION:G1/4", ELECTRICAL CONNECTION:M20X1.5, WEATHERPROOF IP65MAKE: SIEMENS WITH FEEDBACK CARD	Nos	10	Unit 1 and 2	Y	
41	Damper spare	Burner flow control damper positioner for Burner 6	DOUBLE ACTING RELAY MODULE FOR SIEMENS MAKE POSITIONER, MODEL NO: 6DR5020-0NG00-0AA0 PART NO. C73451-A430- D81	Nos	4	Unit 2	Y	
42	Air flow control damper spare	Burner-1,3, 4 and 7 flow control damper positioner	Dia:14 mtrs. Hight-10 mtrs. Capacity- 1500 kl density-0.951 mt/kl ,radar type	Nos	4	Common	Y	
43	HFO and LDO system	HFO tank	Dia- 9 mtr,ht-8 mtrs,radar type	Nos	4	Common	Y	
44	HFO and LDO system	LDO tank	FLP PULL CORD SWITCH (MANUAL RESET TYPE) CONTACT -2NO+2NC , Rating-10Amp., 550V, TYPE-EPC-1	Nos	2	Common	Y	
45	Lime Handling System	Pull Cord Switch	FLP BELT SWAY SWITCH (AUTO RESET TYPE) CONTACT -2NO+2NC ,RATING-10Amp., 550V, TYPE- BSS-1	Nos	116	Common	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
46	Lime Handling System	Belt Sway Switch	FLAME PROOF ELECTRONIC SPEED SWITCH TYPE: RMP211/NITD/2FP,IP65, SUPPLY : 240 VAC,50Hz,INITIAL TIME DELAY:1-20SECS, NUISANCE TIME DELAY:1-20 SECS,O/P CONTACT: 1NO+1NC, CONTACT RATING: 5 AMP,SPEED RANGE: 20-200rpm, NO. OF FLAGS: 2IMP/REV, b) SENSOR PROBE TYPE: SP8.5B30,SUPPLY: 8.5 VDC, ENCLOSURE: SS, IP67, PROBE SIZE:M30X1.5PX65L, SENSING RANGE:9MM+/-10%(EFFECTIVE), 15MM +/-10%(NOMINAL), CABLE : 2CORE,0.4SQMM, 2MTR LONG PVC FLEX, MAKE:JAYASHREE	Nos	86	Common	Y	
47	Lime Handling System	Zero Speed Switch	TEMPERATURE GAUGE FOR HT MOTOR,RANGE: 0-120 DEG C, DIAL SIZE:150MM, BULB DIA /STEM : AISI316, 12MM OD / 87 MM LONG WITH 60MM IMERTION LENGTH COLLAR OD: 17 MM,CAPILLARY :3 MTR,	Nos	12	Common	Y	
48	Lime Handling System	Lime Impactor HT motor temperature gauge	ATPS ITEM CODE:0086766 WIRE,MULTI STANDARD FLEXIBLE ROPE ,WITH PVC	Nos	6	Common	Y	
49	Lime Handling System	Belt Sway And Pull Card Rope	SEAL KIT FOR ACTUATOR ,MODEL ES 100 SET 6 , FAIL TO OPEN, MAKE: EL O MATIC	Mtr	1000	Unit 1 and Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
50	Lime ball valve	Seal kit	SOLENOID VALVES & COIL FOR LIME GATE VALVES,TYPE- 5/3 WAY CETER OFF DOUBLE, MODEL : 51408-6-2R + 220VDC-16-H COIL,ORIFICE - NW - 6MM, PRESSURE : 2 TO 10 BAR, WORK ORDER NO : 10785, TYPE : DOUBLE ACTING , NO. OF COILS : 2 NOS, PROCESS CONNECTION : 1/4" NPT(F), COIL VOLTAGE : 220VDC, SIZE : I, POWER CONSUMPTION : 8WATT, PROTECTION CLASS : IP67, POWER CONSUMPTION - 8 TO 9 WATTMAKE : ROTEX	Set	2	Unit 1 and Unit 2	Y	
51	Lime ball valve	SOV	EL-O-MATIC MAKE BALL VALVE WITH ACTUATOR + LIMIT SWITCHES, OPEN SINGLE ACTING RACK & PINION, TYPE : ES100/3/A, EQUVALENT TO SERIAL NO : 18319,SIZE : 1 1/2", CLASS 6, BALL VALVE SPESIFICATION - BODY : A351 GR. CF8, BALL/DISK : A351 GR. CF8, SEAT PTFE, SHAFT : SS304, RATING 150#, FULL BORE, SUITABLE FOR MOUNTING BETWEEN FLANGES AS PER ANSI B165,LEAKAGE CLASS- VI, 2 PIECE BOADY FLOATING BALL , SCOPE - AUTMATION, ACTUATOR HARD ANODIZED ALUMINIUM, TYPE - RACK & PINION, AIR SUPPLY : 4.5 BAR, FAIL SAFE CONDITION - NORMALLY CLOSE,ACTUATOR SIZING - PRESSURE AS 15 BAR SOLENOID VALVE : 3/2 WAY NAMUR MONUTING WEATHER PROOF, SOLENOID COIL VOLTAGE : 24 VDC, LIMIT SWITCH FOR OPEN & CLOSE : SPDT5A, 230 VAC	Nos	4	Unit 1 and Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
52	Lime ball valve	Actuator	ULTRASONIC LEVEL TRANSMITTER, MODEL : SC22 PT, MAKE : KISTLER MORSE	Nos	2	Unit 1	Y	
53	Lime daybin	Level transmitter	DP gauge make: H.Guru South 0-2.5 bar model:120-s-0-0-p-c(Switzer)	Nos	1	Unit 1 and Unit 2	Y	
54	Lime mill lop	D.P. Gauge	Pressure Switch, GM 204 QM PBB 32, Range : 1.5 TO 4 KGS, Make: Switzer	Nos	3	Unit 1 and Unit 2	Y	
55	Lime mill lop	Pressure switch	Air filter regulator , size:1/4 inch,model no : fpr – 3s,with ss drain & adj. Screw make : Placka	Nos	2	Unit 1	Y	
56	HAG system - 1	Air filter regulator	Pressure gauge , type: bourden tube, dial size: 150mm, range:0-10 kg/cm2 , process connection:1/2" npt(m),mounting: local,dial: white alluminium with black lettering,case material: ss304,window	Nos	2	Unit 1	Y	
57	Lime day bin-1	Pressure Gauge	Pressure gauge , type: bourden tube, dial size: 150mm, range:0-10 kg/cm2 , process connection:1/2" npt(m),mounting: local,dial: white alluminium with black lettering,case material: ss304,window	Nos	2	Unit 1	Y	
58	Lime mill- 1 DE lop system	Pressure Gauge	Temperature gauge range: 0-120 deg c, case: heavy duty die cast alu , dial size:150mm,,junction box provided withtb at bottom entry of case,bulb dia /stem : aisi316, 12mm od / 87 mm long with 60mm imertion lengthwith collar fixed at 60mm form bottom of the bulb,capillary :3 mtr, sensor connection:- aisi ss 316, connection:1/4" bsp(m)	Nos	2	Unit 1	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
59	Mill motor- 1 NDE	Temperature Gauge	Rtd assembly,type-2,sheath length:300 mm,series:art 1003,head:cast aluminium,weather proof,black epoxy powder coated with screwed cover,chain & gasket as per ip-65,instrument entry:1/2"npt(f)	Nos	2	Unit 1	Y	
60	Lime mil- 1 DE / NDE	RTD	Temperature gauge,type : bourden tube, model: 6hdsuw1, size : 150 mm, range : 0 - 120 deg c, stem length::200mm, stem dia:10mm, connection:1/2"bsp(m) adjustable,	Nos	2	Unit 1	Y	
61	Lime mil- 1 DE / NDE	Temperature Gauge	Electronic Speed Switch Type: RMP211/TP/CD/11/M30,Duty: Under Speed,IP65, Supply : 240 VAC,50Hz,Initial Time Delay:1-20secs, Nuisance Time Delay:1-20 secs,O/P Contact: 1NO+1NC, contact rating: 5 amp,Speed Range: 5-50rpm, No. Of Flags: 4imp/Rev, b) sensor probe type: SP8.5B30,Supply: 8.5 vdc, enclosure: SS, IP67, Probe Size:M30X1.5PX65L, Sensing Range:9mm+/-10%(effective), 15mm +/-10%(nominal), cable : 2core,0.4sqmm, 2mtr long pvc flex, Make:Jayashree/Equivalent	Nos	2	Unit 1	Y	
62	Screw pump 1A	Speed sensor and controller	Pressure transmitter, power supply:2 wire 24 vdc,loop powered, process connection: 1/2" npt(f) on manifolds, calibration range:-0 to 10bar,Output 4-20 mA, Make Yokogawa/Emerson	Set	2	Unit 1 and Unit 2	Y	
63	Lime compressor conveying pressure transmitter	Pressure transmitter	Pressure gauge , type: bourden tube, dial size: 150mm, range:0-10 kg/cm2 , process connection:1/2" npt(m),mounting: local,dial: white alluminium with black lettering,case material: ss304,window	Nos	1	Unit 1 and Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
64	Lime compressor conveying pressure gauge	Pressure Gauge	Seal kit, make: elomatic, model:es1600	Nos	1	Unit 1 and Unit 2	Y	
65	Lime ball valve	Seal kit	SOV make: rotex, type:30310-3,5-2G-M1 coil-220 vdc	Set	2	Unit 1 and Unit 2	Y	
66	Lime ball valve	SOV	Actuator double acting with sov make:elomatic, model:es1600,sov , make rotex,(one input-three output) type:30310 3,5-2g-m1 coil-220 vdc. Actuator not working condition	Nos	4	Unit 1 and Unit 2	Y	
67	Lime ball valve	Actuator	Level transmitter make: kistler-morse automation (ultra wave) sr.no.63-1232,63-1240	Nos	2	Unit 2	Y	
68	Lime daybin	Level transmitter	TACHO SENSOR FOR LIME WF 141.75 MM JOB NO. 50.465,MAKE: FLSMIDTH,	Nos	1	Unit 2	Y	
69	Lime weigh feeder-2	Tacho Sensor Assembly	Pressure Switch, GM 204 QM PBB 32, Range : 1.5 TO 4 Kgs, Make: Switzer	Nos	1	Unit 2	Y	
70	Lime mill – 2 lop system	Pressure switch	Differential pressure switch cum guage, power supply:240 vac, process connection: 1/4" npt(f) on manifolds fluid:oil, range:0 to 4 bar, make: switzer, model no:120s-0-0-p-c	Nos	32	Unit 2	Y	
71	Lime mill – 2 lop system	Diff. Pressure switch	PRESSURE GAUGE(GLYCERINE FILLED),TYPE: BOURDON TUBE ,RANGE :- 0 TO 10 KG/CM2,CASE MAERIAL:SS 304, DIAL SIZE:100MM, CONNECTION:3/8"NPT(M) ,ACCURACY: +/- 1% FSD,	Nos	3	Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
72	Lime mill – 2 lop system	Pressure gauge	TEMPERATURE GAUGE,TYPE : BOURDEN TUBE, MODEL: 6HDSUW1, SIZE : 150 MM, RANGE : 0 - 120 DEG C, STEM LENGTH::200MM, STEM DIA:10MM, CONNECTION:3/4"BSP(M) ADJUSTABLE, ACCURACY:+/-1%FSD, BODY MATERIAL:SS316,	Nos	10	Unit 2	Y	
73	Lime mill – 2 lop system	Temperature gauge	Ignition electrode, application:hot air generator, cbl job no.:01948, make: Coen Bharat Ltd.	Nos	5	Unit 2	Y	
74	Hag system	Ignitor set	Iscan flame scanner (2653-213-12), non-flame proof with plug in cable, :hot air generator, cbl job no.:01948, make: Coen Bharat Ltd.	Set	1	Unit 2	Y	
75	Hag system	Flame scanner	PNEUMATIC POSITIONER FOR POWER CYLINDER MODEL - HTP ,POSITIONER MODEL: PCP001, MAKE: INSTRUMENTATION LTD.	Nos	1	Unit 2	Y	
76	Hag jack shaft actuator	Positioner	SOLENOID VALVE,TYPE:5/2 WAY DIRECT ACTING NORMALLY CLOSED SINGLE SOLENOID, MODEL NO.:51400-6-2G-B2+220V-50Hz-15-H, END CONNECTION:1/4"BSP(F),MEDIA: AIR, OP.PR. 2-10 BAR, ORIFICE:NW=6MM,FLOW FACTOR:12LIT/MIN, SOLENOID COIL INSULATION CLASS:H, NO. OF SOLENOID:1,COIL SIZE:I,COIL VOLTAGE:220VAC, 6W,SEAT MOC: NBR, BODY MOC:BRASS, SOLENOID ENCLOSURE: TERMINAL BOX IP67, MANUAL OVERRIDE:PUSH TYPE, MAKE: ROTEX	Nos	1	Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
77	Bag filter purging system	Solenoid valve	Complete Sequential Control Card With DF 10 CHN with channel selection plus time, Type:ZIM-(10)I(IM), Make:IMSICON Input 230 Volt & output 230 Volt A.C, sl no:B-9032 & B-9033	Nos	10	Unit 2	Y	
78	Lime daybin	Pressure gauge	Pressure gauge , type: bourden tube, dial size: 150mm, range:0-10 kg/cm2 , process connection:1/2" npt(m),mounting: local,dial: white alluminium with black lettering,case material: ss304,window	Nos	1	Unit 2	Y	
79	Hag system	Copper tube	Copper tube, type: pvc coated,od:6mm , id:4mm, moc: copper	Mtr	20	Unit 2	Y	
80	Hag system	Air filter regulator	Air filter regulator , size:1/4 inch,model no : fpr – 3s,with ss drain & adj. Screw make : Placka	Nos	1	Unit 2	Y	
81	Chain conveyor speed	Speed switch	Electronics speed controller, type : rm 2211/22/cc, sr. No : 56127, oa no : 8538, supply voltage : 110 vac, 50 hz, speed sensing range : rpm 50 to 500, range calibrated for 2 imp/rev, o/p contact rating : 6 amp, 240v, o/p contacts : 1no + 1nc, make : Jayshree Electron Pvt. Ltd.	Nos	1	Unit 2	Y	
82	Bag filter control damper	Air filter regulator	Air filter regulator , size:1/4 inch,model no : fpr – 3s,with ss drain & adj. Screw	Nos	1	Unit 2	Y	
83	Bag filter purging system	Pressure gauge	Pressure gauge , type: bourden tube, dial size: 150mm, range:0-10 kg/cm2 , process connection:1/2" npt(m),mounting: local,dial: white alluminium with black lettering,case material: ss304,window	Nos	1	Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
84	RC fan control damper	I/P convertor	I/P CONVERTOR MODEL TEI P11 18311-0-1822101 INPUT SIGNAL :4-20 MADC, OUTPUT: 3 TO 15 PSI, CONNECTION: 1/4"NPT(F) ,IP: 65, CHARACTERISTIC : LINEAR,ACCURACY : +/- 0.5%,AMBIENT TEMP. EFFECT : < 0.05%/K, ZERO & SPAN, DEAD BAND: +/- 0.5%, CABLE ENTRY:1/2"NPT(F), ENCLOSURE: DIE CAST ALU, AIR CONSUMPTION: 0.1SCFM, AIR CAPACITY:2.4SCFM, VIBRATION:1%UP TO 10G, FREQUENCY 10 TO 80 Hz, RESPONSE SENSITIVITY: -20 TO 85 DEG C, AMBIENT TEMP EFFECT: <0.05%/K, ZERO 7 SPAN, MAKE: ABB	Nos	1	Unit 2	Y	
85	Lime mill DE lop	Pressure gauge	Pressure gauge(glycerine filled),type: bourdon tube ,range :- 0 to 10 kg/cm2,case maerial:ss 304, dial size:100mm, connection:3/8"npt(m) ,accuracy: +/- 1% fsd,	Nos	1	Unit 2	Y	
86	Lime mill DE lop	Diff. Pressure gauge	DP gauge make: H.Guru South 0-2.5 bar model:120-s-0-0-p-c(Switzer)	Nos	1	Unit 2	Y	
87	Lime mill DE lop	Pressure switch	Pressure switch make: switzer pressure switch, 0 -7 Bar	Nos	2	Unit 2	Y	
88	Mill motor DE temp	Temperature gauge	Temperature gauge,type : bourden tube, model: 6hdsuw1, size : 150 mm, range : 0 - 120 deg c, stem length::200mm, stem dia:10mm, connection:1/2"bsp(m) adjustable,	Nos	1	Unit 2	Y	
89	Lime mill inlet pressure	Pressure gauge	Pressure gauge , type: bourden tube, dial size: 150mm, range:-250 to 0 mmh2o , process connection:1/2" npt(m),mounting: local,dial: white alluminium with black lettering,case material: ss304,window	Nos	1	Unit 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
90	Screw pump – 2A	Electronic speed switch	ELECTRONIC SPEED CONTROLLER, SR NO: RM E211/R3/2K2,MAKE:JAYSHREE ELECTRON PVT LTD.APPLICATION: LIME SYSTEM	Set	1	Unit 2	Y	
91	Lime feeding rotary -2A	Electronics speed controller	ELECTRONIC SPEED CONTROLLER, SR NO: RM E211/R3/2K2,MAKE:JAYSHREE ELECTRON PVT LTD.APPLICATION: LIME SYSTEM	Nos	1	Unit 2	Y	
92	Lime bunker	Radar type level transmitter	Radar type level transmitter(Bidder needs to take dimension on site)	Nos	2	Common	Y	
93	Lime compressor – 1 A,1B & 2A,2 B.oil pressure switch	Pressure switch	Pressure switch make: Switzer Pressure Switch, 0 -7 Bar	Nos	8	Unit 1 and 2	Y	
94	Lime compressor – 1 A,1B & 2A,2B discharge pressure gauge	Pressure gauge	Pressure gauge , type: bourden tube, dial size: 150mm, range:0-10 kg/cm2 , process connection:1/2" npt(m),mounting: local,dial: white alluminium with black lettering,case material: ss304,window	Nos	8	Unit 1 and 2	Y	
95	Lime compressor – 1 A,1B & 2A,2B discharge pressure switch	Pressure switch	Pressure switch make: Switzer pressure switch, 0 -7 BAR	Nos	8	Unit 1 and 2	Y	
96	Lime compressor – 1 A,1B & 2A,2B discharge temp gauge	Temperature gauge	Temperature gauge,type : bourden tube, model: 6hdsuw1, size : 150 mm, range : 0 - 120 deg c, stem length::200mm, stem dia:10mm, connection:1/2"bsp(m) adjustable,	Nos	8	Unit 1 and 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
97	Lime compressor – 1 A,1B & 2A,2B load/unload sov na.	Load/unload sov	Make: rotex,type : NO,B738207,type: 30206-2.5-2G,W.O.No: 5B0807/936,ATM: 0~16,media : air,coil type : 11-240V-50 Hz-11w-01,10/2010-04/05/50,	Nos	8	Unit 1 and 2	Y	
98	Lime compressor – 1 A,1B & 2A,2B buster relay	Booster relay	Booster relay,Part No: IL100-03,Make: SMC,Size: 3/8 inch.	Nos	8	Unit 1 and 2	Y	
99	Lime compressor – 1 A,1B & 2A,2B oil pressure gauge	Pressure gauge	Pressure gauge(glycerine filled),type: bourdon tube ,range :- 0 to 10 kg/cm2,case material:ss 304, dial size:100mm, connection:3/8"npt(m) ,accuracy: +/- 1% fsd,	Nos	8	Unit 1 and 2	Y	
100	Lime compressor – 1 A,1B & 2A,2B oil temp gauge	Temperature gauge	Temperature gauge,type : bourden tube, model: 6hdsuw1, size : 150 mm, range : 0 - 120 deg c, stem length::200mm, stem dia:10mm, connection:1/2"bsp(m) adjustable,	Nos	8	Unit 1 and 2	Y	
101	Lime compressor – 1 A,1B & 2A,2B oil temp switch	Temp. switch	Temp switch, 720 series with GM 7230GJ Q4K 33Z ,Range:30TO 200°c, Make: Switzer/ Equivalent	Nos	8	Unit 1 and 2	Y	
102	Lime compressor – 1 A,1B & 2A,2B water pressure switch	Pressure Switch	Pressure switch make: Switzer Pressure Switch, 0 -7 bar	Nos	8	Unit 1 and 2	Y	
103	Lime compressor – 1 A,1B & 2A,2B water pressure gauge	Pressure gauge	Pressure gauge , type: bourden tube, dial size: 150mm, range:0-10 kg/cm2 , process connection:1/2" npt(m),mounting: local,dial: white alluminium with black lettering,case material: ss304,window	Nos	8	Unit 1 and 2	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
104	Lime compressor – 1 A,1B & 2A,2B water i/l temp gauge	Temp gauge	Temperature gauge,type : bourden tube, model: 6hdsuw1, size : 150 mm, range : 0 - 120 deg c, stem length::200mm, stem dia:10mm, connection:1/2"bsp(m) adjustable,	Nos	8	Unit 1 and 2	Y	
105	Lime compressor – 1 A,1B & 2A,2B water o/l flow switch	Flow switch	Flow switch paddle type, service: water, process connection: 1/2"bsp(f) screwed , ip65 weatherproof, cable entry:1/2"npt(f),	Nos	8	Unit 1 and 2	Y	
106	Ash Cooler Pump discharge pressure	Pressure transmitter (for discharge pressure)	SMART (HART) GAUGE PRESSURE TRANSMITTER,MODEL - 2051TA2A2B21AB4K5M5D4Q4, CAL RANGE:0-6 BAR ABS,MEDIUM:STEAM,OPERATING PRESSURE:4 BAR,OP. TEMP.: 100'C,OVER PRESSURE : 10 BAR,FUNCTION:TRANSMISSION-INDICATION,ACCU:+/-0.075% OF SPAN,SUP.VOLT: 24 VDC,ELEMENT:DIAPHRAGM,EX-PROOF&INTRINSICSAFE,ENCL CLASS:IP65-NEMA4X,ELEMENT MATERIAL :316L SS,ENCLOSER MATERIAL:LOW COPPER ALUMINIUM POLYURETHANE PAINT,O/P :2 WIRE,4-20 MADC,PROCESS CONN.:1/2"NPT(F),2"PIPE MOUNTING,CABLE ENTRY:1/2"NPT(F),INT.MTR:5 DIGIT LCD,CABLE GLAND:DOUBLE COMPRESSION, MAKE: ABB/EQUIVALENT	Nos	3	Common	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
107	Ash Cooler Pump	Vibration probe	VIBRATION SENSOR, TYPE : PIEZO VELOCITY TRANSDUCER, TOP CONNECTOR, 100 MV/IN/SEC, PART NO : RN-AC-109-2A, SENSITIVITY : +/-10%, POWER : 18-30V DC, DYNAMIC RANGE : +/-50 IN/SEC PEAK, VIBRATION LIMIT : +/-50G, TEMP. RANGE : -58 TO 250'F, SENSING ELEMENT : PZT CERAMIC, SENSING STRUCTURE : SHEAR MODE, CASE MATERIAL : SS316L, MOUNTING : 1/4-28 TAPPED HOLE, CONNECTOR : 2 PIN MIL-C-5015, MOUNTING H/W : 1/4-28 STUD, CALIBRATION CERTIFICATE : CA10, MAKE: SHINKAWA FORBES MARSHALL SENSOR EXTENSION CABLE WITH SS CONDUIT, TYPE : FML-EXTCAB-020, CABLE LENGTH : 20 MTR, APPLICATION : SUITABLE FOR VIBRATION SENSOR, MODEL : RN-AC-109 2A, MAKE : SHINKAWA FORBES MARSHALL	Nos	3	Common	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
108	Ash Cooler Pump DE/NDE bearing temperature	RTD	RTD ASSEMBLY,TYPE-4,SHEATH LENGTH:625 MM,SERIES:ART 1003,HEAD:CAST ALUMINIUM,WEATHER PROOF,BLACK EPOXY POWDER COATED WITH SCREWED COVER,CHAIN & GASKET AS PER IP-65,INSTRUMENT ENTRY:1/2"NPT(F),INSET TYPE:PT-100,DUPLEX,3 WIRE,INSULATION:MINERAL INSULATED(COMPACT MGO),ACCURACY:DIN 43760 CLASS "A",SHEATH MATERIAL:SS316,SHEATH DIA:06 MM,TERMINAL:NICKEL PLATED BRASS TERMINAL MOUNTED ON STEATITE GRADE CERAMIC BLOCK WITH SPRING LOADED SCREW FIXED ON SS BASE,PROCESS CONN:1/2"NPT(M) MADE UP-SS,MAKE:ALTOP	Nos	3	Common	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
109	Ash Cooler motor	Vibration probe	VIBRATION SENSOR, TYPE : PIEZO VELOCITY TRANSDUCER, TOP CONNECTOR, 100 MV/IN/SEC, PART NO : RN-AC-109-2A, SENSITIVITY : +/-10%, POWER : 18-30V DC, DYNAMIC RANGE : +/-50 IN/SEC PEAK, VIBRATION LIMIT : +/-50G, TEMP. RANGE : -58 TO 250'F, SENSING ELEMENT : PZT CERAMIC, SENSING STRUCTURE : SHEAR MODE, CASE MATERIAL : SS316L, MOUNTING : 1/4-28 TAPPED HOLE, CONNECTOR : 2 PIN MIL-C-5015, MOUNTING H/W : 1/4-28 STUD, CALIBRATION CERTIFICATE : CA10, MAKE: SHINKAWA FORBES MARSHALL SENSOR EXTENSION CABLE WITH SS CONDUIT, TYPE : FML-EXTCAB-020, CABLE LENGTH : 20 MTR, APPLICATION : SUITABLE FOR VIBRATION SENSOR, MODEL : RN-AC-109 2A, MAKE : SHINKAWA FORBES MARSHALL	Nos	3	Common	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
110	Fans	Vibration probe	VIBRATION SENSOR, TYPE : PIEZO VELOCITY TRANSDUCER, TOP CONNECTOR, 100 MV/IN/SEC, PART NO : RN-AC-109-2A, SENSITIVITY : +/-10%, POWER : 18-30V DC, DYNAMIC RANGE : +/-50 IN/SEC PEAK, VIBRATION LIMIT : +/-50G, TEMP. RANGE : -58 TO 250'F, SENSING ELEMENT : PZT CERAMIC, SENSING STRUCTURE : SHEAR MODE, CASE MATERIAL : SS316L, MOUNTING : 1/4-28 TAPPED HOLE, CONNECTOR : 2 PIN MIL-C-5015, MOUNTING H/W : 1/4-28 STUD, CALIBRATION CERTIFICATE : CA10, MAKE: SHINKAWA FORBES MARSHALL SENSOR EXTENSION CABLE WITH SS CONDUIT, TYPE : FML-EXTCAB-020, CABLE LENGTH : 20 MTR, APPLICATION : SUITABLE FOR VIBRATION SENSOR, MODEL : RN-AC-109 2A, MAKE : SHINKAWA FORBES MARSHALL	Nos	22	Common	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
111	BFP pumps	Vibration probe	VIBRATION SENSOR, TYPE : PIEZO VELOCITY TRANSDUCER, TOP CONNECTOR, 100 MV/IN/SEC, PART NO : RN-AC-109-2A, SENSITIVITY : +/-10%, POWER : 18-30V DC, DYNAMIC RANGE : +/-50 IN/SEC PEAK, VIBRATION LIMIT : +/-50G, TEMP. RANGE : -58 TO 250'F, SENSING ELEMENT : PZT CERAMIC, SENSING STRUCTURE : SHEAR MODE, CASE MATERIAL : SS316L, MOUNTING : 1/4-28 TAPPED HOLE, CONNECTOR : 2 PIN MIL-C-5015, MOUNTING H/W : 1/4-28 STUD, CALIBRATION CERTIFICATE : CA10, MAKE: SHINKAWA FORBES MARSHALL SENSOR EXTENSION CABLE WITH SS CONDUIT, TYPE : FML-EXTCAB-020, CABLE LENGTH : 20 MTR, APPLICATION : SUITABLE FOR VIBRATION SENSOR, MODEL : RN-AC-109 2A, MAKE : SHINKAWA FORBES MARSHALL	Nos	12	Common	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
112	Hot Water pumps	Vibration probe	VIBRATION SENSOR, TYPE : PIEZO VELOCITY TRANSDUCER, TOP CONNECTOR, 100 MV/IN/SEC, PART NO : RN-AC-109-2A, SENSITIVITY : +/-10%, POWER : 18-30V DC, DYNAMIC RANGE : +/-50 IN/SEC PEAK, VIBRATION LIMIT : +/-50G, TEMP. RANGE : -58 TO 250'F, SENSING ELEMENT : PZT CERAMIC, SENSING STRUCTURE : SHEAR MODE, CASE MATERIAL : SS316L, MOUNTING : 1/4-28 TAPPED HOLE, CONNECTOR : 2 PIN MIL-C-5015, MOUNTING H/W : 1/4-28 STUD, CALIBRATION CERTIFICATE : CA10, MAKE: SHINKAWA FORBES MARSHALL SENSOR EXTENSION CABLE WITH SS CONDUIT, TYPE : FML-EXTCAB-020, CABLE LENGTH : 20 MTR, APPLICATION : SUITABLE FOR VIBRATION SENSOR, MODEL : RN-AC-109 2A, MAKE : SHINKAWA FORBES MARSHALL	Nos	12	Common	Y	
113	Flue gas analyzer	SO2/NOX/CO ANALYSER	MODEL: CODEL GCEM 4000,SO2/NOX TRANSCEIVER UNIT WITH 10.MTR CABLE,TEMP TRANSMITTER WITH 3 MTR. CABLE,PRESSURE ,SS316 PROBE(1.8 MTR.) INSERTION LENGTH.TRANSMITTER WITH 3 MTR. CABLE	Nos	2	Common	Y	
114	Flue gas analyzer	GC-4 CG4 PANEL FOR SOX NOX CO ANALYSER	CODE 4000349 ALONGWITH SC4, PS4, AIR AL DRYER AND TERMINAL COIL WITH ROTOMETER CALIBRATION CORD	Nos	2	Common	Y	

S. No	Component	Item	Description	UOM	Quantity	Unit 1/Unit 2	Cat 1	Cat 2
115	Flue gas analyzer	Zirconia Oxygen Analyzer:	ABB make Endura AZ20 series - with internal Automatic Calibration Hardware Model No. : AZ20/.1.2.2.1.2.2.3.4.1.1.1.21.0.0.E./STD + Abrasive Shield	Nos	4	Common	Y	
116	TAPH	TAPH O2 Outlet Analyzer		Nos	2	Unit 1 and Unit 2	Y	

Annexure 3: Spares for ESP retrofitting

Sr. No	Component	Item	Activity	Description	UOM	Quantity	Unit 1/Unit 2
1	Mechanical	Patching Material for casing plate (30%) and hopper plate (30%)	Complete replacement	6mm MS Plate	Lot	1	Unit 1 and Unit 2
2	Mechanical	Inlet funnel	Complete replacement	6mm MS Plate	Lot	1	Unit 1 and Unit 2
3	Mechanical	Outlet funnel	Complete replacement	6mm MS Plate	Lot	1	Unit 1 and Unit 2
4	Mechanical	Outer Roof with handrail for Pass-A	Complete replacement	5 O/P chq plate with handrail	Lot	1	Unit 2
5	Mechanical	Inlet Gas Distribution Screen (3 layers)	Complete replacement	MS, 2 mm Thk	Lot	1	Unit 1 and Unit 2
6	Mechanical	Inlet GD rapping system	Complete replacement		Lot	1	Unit 1 and Unit 2
7	Mechanical	Collecting Electrodes	Complete replacement	1.25 mm Thk, CRCA sheet, IS 513 Gr	Lot	1	Unit 1 and Unit 2
8	Mechanical	Emitting Electrodes	Complete replacement	Spiral (904L)	Lot	1	Unit 1 and Unit 2
9	Mechanical	Emitting frame	Repair existing item	Drawing No.KP-0010118.Model No. 7x30H-96-150-A2			Unit 1 and Unit 2
10	Mechanical	Collecting Rapping system including shock bars and shock bar guide	Complete replacement	Drawing No.KP-0010108,Model No. 7x30H-96-150-A2	Lot	1	Unit 1 and Unit 2
11	Mechanical	Emitting Rapping system	Complete replacement	Drawing No,KP-0010172, Model No. 7x30H-96-150-A2	Lot	1	Unit 1 and Unit 2
12	Mechanical	Outlet GD Screen	Complete replacement	Drawing No.KP-1011132, Model No. 7x30H-96-150-A2	Lot	1	Unit 1 and Unit 2
13	Mechanical	Collecting suspension	Repair existing item	Drawing No.KP-0010173, Model No. 7x30H-96-150-A2			Unit 1 and Unit 2
14	Mechanical	Emitting suspension	Repair existing item	Drawing No,KP-0010172, Model No. 7x30H-96-150-A2			Unit 1 and Unit 2
15	Mechanical	Casing side screen	Complete replacement	Drawing No.KP-1010769,Model No. 7x30H-96-150-A2	Lot	1	Unit 1 and Unit 2

Sr. No	Component	Item	Activity	Description	UOM	Quantity	Unit 1/Unit 2
16	Mechanical	Hopper Gas screen for 1st two field hoppers	Repair existing item	Balance field repairing	Lot	1	Unit 1 and Unit 2
17	Mechanical	Casing Man hole doors	Complete replacement	500x700mm Hinge type manhole door	Nos	18	Unit 1 and Unit 2
18	Mechanical	Insulator Housing & Bus duct	Repair existing item				Unit 1 and Unit 2
19	Mechanical	Disconnecting Switch (top cover and internal materials)	Complete replacement	Top cover repair / replacement and internal materials fillup / replacement	Nos	4	Unit 1 and Unit 2
20	Mechanical	Emitting Rapping system Geared motor cover enclosure at ESP roof	Partial replacement	14 nos. enclose at roof	Nos	14	Unit 1 and Unit 2
21	Mechanical	Monorail over roof for TR handling	Repair existing item				Unit 1 and Unit 2
22	Mechanical	Insulation	Complete replacement	(IS: 8183-1993, 50 mm thk, 100 kg/m3); Inlet funnel 100%, outlet funnel 100%, casing 100%, roof 100%.	Lot	1	Unit 1 and Unit 2
23	Mechanical	Cladding	Complete replacement	(Plain Al, 24 SWG); inlet funnel 100%, outlet funnel 100%, casing 30% replacement and balance reutilization.	Lot	1	Unit 1 and Unit 2
24	Mechanical	Handrail in U#2, pass A sea side at hopper maintenance platform	Complete replacement	All 14 nos. of hoppers and top roof side railing with standard handrail pipe	Nos	14	Unit 2
25	Mechanical	Mechanical safety interlock	Complete replacement	All 18 nos. door in each Unit	Nos	36	Unit 1 and Unit 2
26	Mechanical	Non-metallic Expansion joints for ESP inlet and outlet flange	Complete replacement	1. ESP Inlet Non Mettalic Bellow ,K41 and K42 , Size-3194x3194,Drawing No.KE.EN0174.04 2.ESP Outlet Non mettalic bellow, K81 and K82, Size-3194x3194,Drawing No.KE.EN0174.03	Nos	4	Unit 1 and Unit 2

Sr. No	Component	Item	Activity	Description	UOM	Quantity	Unit 1/Unit 2
27	Mechanical	ESP inlet and outlet Guillotine Gates	Repair existing item	Repair, servicing to make leakproof and make operative. Seals (SS 316) and actuator to be replaced if needed.	Nos	4	Unit 1 and Unit 2
28	Mechanical	ESP inlet & ESP outlet duct patch work (between Guillotine Gates)	Repair existing item	Patch repair 50% plate area max.	Lot	1	Unit 1 and Unit 2
29	Mechanical	Hopper fluidizing pad	Complete replacement	400 mm dia x 1” thick	Lot	1	Unit 1 and Unit 2
30	Mechanical	Piping for hopper fluidizing system	Complete replacement	80 NB Pipe medium	Mtr	100	Unit 1 and Unit 2
31	Mechanical	Hot air purging system for support and shaft Insulators	Complete replacement		Set	1	Unit 1 and Unit 2
32	Electrical and instrumentation	Geared Motor for Collecting Rapping	Partial replacement	6 nos. new supply, balance existing servicing/ overhauling	Nos	6	Unit 1 and Unit 2
33	Electrical and instrumentation	Geared Motor for Emitting Rapping	Partial replacement	6 nos. new supply, balance existing servicing/ overhauling	Nos	6	Unit 1 and Unit 2
34	Electrical and instrumentation	Support Insulators (Cyl)	Complete replacement	Porcelain	Nos	20	Unit 1 and Unit 2
35	Electrical and instrumentation	Shaft Insulator	Complete replacement	Porcelain	Nos	6	Unit 1 and Unit 2
36	Electrical and instrumentation	Bushing Insulator	Complete replacement	Porcelain	Nos	3	Unit 1 and Unit 2
37	Electrical and instrumentation	Heater - Support Insulator	Complete replacement	1 KW, tubular	Nos	23	Unit 1 and Unit 2
38	Electrical and instrumentation	Heater - Shaft Insulator	Complete replacement	1 KW, tubular	Nos	6	Unit 1 and Unit 2
39	Electrical and instrumentation	Heater – Hopper	Complete replacement	1 KW, tubular	Nos	45	Unit 1 and Unit 2
40	Electrical and instrumentation	Thermostat	Complete replacement		Nos	40	Unit 1 and Unit 2
41	Electrical and instrumentation	Dust Level sensors with controller and 40 m cable	Complete replacement		Set	12	Unit 1 and Unit 2
42	Electrical and instrumentation	Sealing gaskets / rope for ESP	Complete replacement		Lot	1	Unit 1 and Unit 2

Sr. No	Component	Item	Activity	Description	UOM	Quantity	Unit 1/Unit 2
		doors and Insulator housing					
43	Electrical and instrumentation	TR sets 1 ph with control panel	Repair existing item	For 3rd to 7th field	Nos	10	Unit 1 and Unit 2
44	Electrical and instrumentation	Microprocessor controller EPIC-III with integrated rapping control	Complete replacement	For 3rd to 7th field	Nos	11 (10 + 1 spare)	Unit 1 and Unit 2
45	Electrical and instrumentation	Ethernet Terminal Unit (ETU)	Complete replacement	For EPIC-III and SIR	Nos	2 (1 + 1 spare)	Unit 1 and Unit 2
46	Electrical and instrumentation	Retrofit Kit for EPIC-II to EPIC-III conversion of existing TR panel			Nos	10	Unit 1 and Unit 2
47	Electrical and instrumentation	SIR (85KV/1400mA) with controller	Complete replacement	GE make HFTR for 1st & 2nd fields	Set	4	Unit 1 and Unit 2
48	Electrical and instrumentation	Ethernet package (Unmanaged Ethernet switch with power adapter, cat5 cable, Opto Cable, connectors, JB etc.)	Complete replacement		Lot	1	Unit 1 and Unit 2
49	Electrical and instrumentation	ESP TR / SIR control signal through optical cable with Ethernet port at DCS room	Complete replacement	1pprox 300 m cable laying distance.	Lot	1	Unit 1 and Unit 2
50	Electrical and instrumentation	ACP (auxiliary control panel) feeders for 3 phase power supply to SIR at ESP roof.	Repair existing item	Existing are 3 phase compatible with 400 Amp rating and shall be used.	Nos	4	Unit 1 and Unit 2

Sr. No	Component	Item	Activity	Description	UOM	Quantity	Unit 1/Unit 2
51	Electrical and instrumentation	ACP (auxiliary control panel) feeders for Hot air purging system	Partial replacement	1 no. existing spare TR feeder ready to use in U#1, make ready the empty feeder for U#2	Nos	1	Unit 2
52	Electrical and instrumentation	Local Push Button Station for geared motors	Complete replacement		Nos	30	Unit 1 and Unit 2
53	Electrical and instrumentation	Earthing rods	Complete replacement		Nos	28	Unit 1 and Unit 2
54	Electrical and instrumentation	Power Cable and cable tray for new cable for SIR (HFTR) and rapping interface	Complete replacement		Lot	1	Unit 1 and Unit 2
55	Electrical and instrumentation	Above ground earthing system (GI strip, wire) for all new supplied equipment to be connected with existing earthing network	Complete replacement	Replacement of earthing wire etc. as needed.	Lot	1	Unit 1 and Unit 2
56	Electrical and instrumentation	Motorised hoist at ESP roof	Complete replacement		Nos	2	Unit 1 and Unit 2
57	Electrical and instrumentation	Cable dressing if existing cable trays	Complete replacement				Unit 1 and Unit 2
58	Electrical and instrumentation	Switch gear components (detailed below)	Complete replacement				Unit 1 and Unit 2
58.1	Electrical and instrumentation	Contactor		MN 16 Contactor L&T AC-1 30A 220-230V 415V AC 3PHASE	Nos	20	Unit 1 and Unit 2
58.2	Electrical and instrumentation	Relay		O/E/N Relay 3R 3 24 70 OHMS 24AC 0118	Nos	50	Unit 1 and Unit 2
58.3	Electrical and instrumentation	Time Totaliser		Time Totaliser KAYCEE	Nos	7	Unit 1 and Unit 2
58.4	Electrical and	RTU panel SFU			Nos	10	Unit 1 and Unit 2

Sr. No	Component	Item	Activity	Description	UOM	Quantity	Unit 1/Unit 2
	instrumentation	handle					
58.5	Electrical and instrumentation	Auxiliary contactor		Auxiliary contactor RL4R GE make (Relay)	Nos	1	Unit 1 and Unit 2
58.6	Electrical and instrumentation	Main contactor		GE make CK95BE300	Nos	1	Unit 1 and Unit 2
58.7	Electrical and instrumentation	KV meter		DC	Nos	2	Unit 1 and Unit 2
58.8	Electrical and instrumentation	Miliampere meter		DC	Nos	2	Unit 1 and Unit 2
58.9	Electrical and instrumentation	AC primary ampere meter			Nos	2	Unit 1 and Unit 2
58.10	Electrical and instrumentation	AC primary voltage meter			Nos	2	Unit 1 and Unit 2
58.11	Electrical and instrumentation	Technic make add on block for auto/Manual, start and stop button used in ERM/ CRM switchgear			Nos	30	Unit 1 and Unit 2
59	Electrical and instrumentation	TR oil Change	Complete replacement	For 3rd to 7th field – mineral oil	Nos	10	Unit 1 and Unit 2
60	Electrical and instrumentation	Silica gel holder / TR sets Breather replacement all TR set for both unit ESPs	Complete replacement		Lot	1	Unit 1 and Unit 2
61	Electrical and instrumentation	Attending all Existing TR sets body oil leakages	Complete replacement		Lot	1	Unit 1 and Unit 2
62	Special tools and tackles	Torque wrench			Nos	2	Unit 1 and Unit 2
63	Special tools and tackles	Stretching Tool for Emitting Electrode			Nos	2	Unit 1 and Unit 2
64	Mechanical	CRM gear box		Model No.G43G01-10/DK 74,Power-0.37KW,1.1RPM,Make-Internation combustion I Ltd.	Nos	3	Unit 1 and Unit 2
65	Mechanical	ERM gear box		Model No.G43G01-20/DK 74-178, Power-0.3KW,2.2 RPM,Motor Speed-1330,Make-Internation combustion I Ltd.	Nos	3	Unit 1 and Unit 2

Sr. No	Component	Item	Activity	Description	UOM	Quantity	Unit 1/Unit 2
66	Electrical and instrumentation	CRM/ ERM motor			Nos	9	Unit 1 and Unit 2
66.1	Electrical and instrumentation	CRM Motor		CRM motor:-Sr no 25255,Frame Size:-G43G01-10/DK74-178,Voltage 415,3 phase ,motor rpm 1330,S1, Cos phi, 0.72,Insl Class F IP65,kw 0.37,rpm 1.10,Amp 1.1, Star 415v/50hz, V1, mtg, oil isolvg 220 qty 2.7/0 L 38,Make IC BAURE	Nos	4	Unit 1 and Unit 2
66.2	Electrical and instrumentation	ERM Motor		ERM motor:-Sr no 25268,Frame Size G43G04-20/DK74-178,Voltage 415,3 phase,rpm 2.2,motor rpm 1330,S1, Cos phi, 0.72,Insl Class F IP65,kw 0.37,Amp 1.1, Star 415v/50hz, V1, mtg, oil isolvg 220 qty 4.5/0 L 38,Make IC BAURE	Nos	5	Unit 1 and Unit 2
67	Electrical and instrumentation	Axial exhaust fan	Complete replacement	Axial exhaust fan: MAKE-KHAITAN,VOLTS-415,AMPS-0.5,RPM-700,WATT -240W,PHASE-3,HZ-50,SERIAL NO-C804	Nos	3	Unit 1
68	Electrical and instrumentation	Axial exhaust fan	Complete replacement	Axial exhaust fan:- Phase-3,Volts-415,RPM-1415,KW-1.1,,HZ-50,FRAME NO-ND905,MAKE-Crompton Graves	Nos	3	Unit 1
69	Electrical and instrumentation	Axial exhaust fan	Complete replacement	Axial Exhaust fan motor :- 3-ø,Sr no. C804, 240watt, 0.5amps, 700rpm, 50Hz, Make :- Khaitan	Nos	2	Unit 2
70	Electrical and instrumentation	Axial exhaust fan	Complete replacement	Axial exhaust fan:- Phase-3,Volts-415,RPM-1415,KW-1.1,,HZ-50,FRAME NO-ND905,MAKE-Crompton Graves	Nos	3	Unit 2
71	ESP MCC	ESP MCC Spares			Lot (to be detailed)	1	
72	Electrical and instrumentation	All ERM Motor Canopy			Nos	28	

Annexure 4: List of Hangers

(Attached separately)

Annexure 5: Letter of bid submission

(To be printed on Bidder's letterhead)

Dated:

To,
General Manager (Power),
Gujarat Mineral Development Corporation Ltd
Khanij Bhavan,
132-Ring Road, Gujarat University Ground, Vastrapur,
Ahmedabad- 380052

Subject: Submission of Bid towards Request for Proposal (RFP) for Boiler and ESP Package for Overhaul of GMDC's 250 (2x125) MW Akrimota Thermal Power Station (ATPS), Gujarat

Dear Sir/Madam,

We, the undersigned, offer to provide services and spares for [Insert title of assignment] in accordance with your Request for Proposal dated [Insert Date] and our Bid. We are hereby submitting our Bid, which includes this Technical Bid, and a Price Bid, as follows.

1. Physical submission of Technical Bid, RFP Fee, and EMD as per the requirement of the RFP
2. Online submission of Price Bid as per the requirement of the RFP

We are submitting our Bid in individual capacity. We hereby declare that all the information and statements made in this proposal are true and accept that any misinterpretation contained in it may lead to our disqualification.

If discussions are held during the period of validity of the Bid, i.e., before the date indicated in RFP, we undertake to negotiate on the basis of the proposed personnel. Our Bid is binding upon us and subject to the modifications resulting from Contract discussions.

We undertake, if our Bid is accepted, to initiate the Overhauling services related to the assignment not later than the period specified in the RFP.

We understand you are not bound to accept any proposal you receive.

We remain,

Yours sincerely,

Authorized Signature [In full and initials]:

Name and Title of Signatory:

Name of Firm:

Address:

Annexure 6: Bidders experience and credentials

A – Pre-Qualification Criteria

1. Bidder's organization

[Provide here a brief description of the background and organization of your firm/entity. The brief description should include Ownership details, date, and place of incorporation of the firm, objectives of the firm etc. Provide supporting documents such as Certificate of Incorporation, MOA, AOA, GSTIN Registration, which may be applicable etc.]

2. Similar works by Bidder

[Using the format below, provide information on each project for which your firm, was legally contracted either individually as a corporate entity or as one of the major partners within an association, for carrying out job similar to the ones specified in Pre-Qualification Criteria set forth in the RFP (If possible, the Bidder shall specify exact job for which experience details may be submitted)]

Parameter	Response
Name of work	
Description of work	
Value of the Contract (in INR)	
Duration of the work (in months)	
Start date (month and year)	
End date (month and year)	

Similar works can include EPC / ETC / Erection / Commissioning / R&M / Overhaul / Maintenance of Boilers and or ESP as part of a single Contract / Agreement / Work Order for a thermal power plant of capacity 250 MW or higher, with each unit of 100 MW or higher

The Bidder must provide document evidence including relevant portions of the work order / Contract / completion certificate for contracts undertaken.

3. IBR certification

[Using the format below, provide information regarding your Special Grade Boiler Repairer License and IBR certified welders on your roll. The Bidder must provide document evidence including a copy of IBR License and certification]

Details of License	Response
State of issue	
Date of issue	
Valid till	

4. Past experience with Overhauling of CFBC Boilers

[Using the format below, provide information on each project for which your firm, was legally contracted either individually as a corporate entity or as one of the major partners within an association, for carrying out Overhauling of a CFBC Boiler]

Parameter	Response
Name of work	
Description of work	
Duration of the work (in months)	
Start date (month and year)	
End date (month and year)	

The Bidder must provide document evidence including relevant portions of the work order / Contract / completion certificate for contracts undertaken

5. Past experience with Overhauling of Boilers above 150 kg/cm2

[Using the format below, provide information on each project for which your firm, was legally contracted either individually as a corporate entity or as one of the major partners within an association, for carrying out Overhauling of a Boiler above 150 kg/cm2]

Parameter	Response
Name of work	
Description of work	
Boiler Pressure (kg/cm2)	
Duration of the work (in months)	
Start date (month and year)	
End date (month and year)	

The Bidder must provide document evidence including relevant portions of the work order / Contract / completion certificate for contracts undertaken

B – Technical Criteria

1. Experience in EPC / ETC / Overhauling of Boiler and ESP at coal or lignite based thermal power plants

   [Using the format below, provide information on each work for which your firm, was legally contracted either individually as a corporate entity or as one of the major partners within an association, as per the Technical Criteria set forth in the RFP]

Parameter	Response
Name of work	
Description of the work	
Capacity of Contract (in MW)	
Value of the Contract (in INR)	
Make of the Boiler	
Type of Boiler (CFBC/PF etc.)	
Boiler capacity (TPH)	
Boiler Pressure (kg/cm2)	
Duration of the work (in months)	
Start date (month and year)	
End date (month and year)	

   The Bidder must provide document evidence including relevant portions of the work order / Contract / completion certificate for contracts undertaken.

2. Experience in erection / retrofitting of ESP

Parameter	Response
Name of work	
Description of the work	
Capacity of Contract (in MW)	
Value of the Contract (in INR)	
Make of the ESP	
Duration of the work (in months)	
Start date (month and year)	
End date (month and year)	

Annexure 7: Declaration of key personnel

Format of Curriculum Vitae (to be provided by all the Key Personnel as mentioned in Section 5.2 of Part 3 of this document)

1. Name of the Personnel: _____
2. Proposed Position for the Project: _____
3. Date of Birth: _____
4. Nationality: _____
5. Education Qualifications: _____

School/College	Degree/Certification	Year of Graduation

6. Languages: _____
7. Years of experience: _____
8. Employment Record: _____

Name of the firm	From – To Date	Designation/Position

9. Work(s) Undertaken that illustrates the capabilities to handle the tasks defined in Part 2 of this document
    a. Name of the assignment: _____
    b. Year: _____
    c. Location: _____
    d. Client: _____
    e. Position(s) held: _____
    f. Key activities performed: _____
10. Any Relevant Certifications: _____

Note: Kindly submit any other copies of CV (if needed) and appropriate certifications with this sheet. Additional sheets may be used to provide any additional information

Authorized Signature [In full and initials]:

Name and Title of Signatory:

Name of Firm:

Address:

Annexure 8: Revenue and net worth statement

(To be printed on Statutory Auditor's/ Registered Chartered Accountant's letterhead)

I hereby declare that I have scrutinized and audited the financial statement of M/s. _____. Following is the audited revenue for the last three years, net worth and working capital for the last year.

Years	Revenue (INR Cr)
2019-2020	
2020-2021	
2021-2022	

Years	Net worth (INR Cr)
As on 31st March 2022	

Annexure 9: No blacklisting certificate

(To be printed on stamp paper of value INR 300)

Format for Affidavit certifying that the Entity/Promoter/s / Director/s of Bidder are not blacklisted

No-Blacklisting Affidavit

I M/s. _____ (Name of the Bidder), (the names and addresses of the registered office) hereby certify and confirm that we or any of our promoter/s / director/s are not barred by Government of Gujarat (GoG) / any other entity of GoG or blacklisted by any state government or central government / department / Local Government / agency in India or from abroad from participating in Project/s, either individually or as member of a Consortium as on the _____ (Bid submission date).

We further confirm that we are aware that our Bid for the captioned Project would be liable for rejection in case any material misrepresentation is made or discovered with regard to the requirements of this RFP at any stage of the Bidding Process or thereafter during theagreement period.

Dated this _____ Day of _____,2023.

Name of the Bidder:

Signature of the Authorized person:

Name of the Authorized person:

Annexure 10: No deviation certificate

(To be printed on Bidder's letterhead)

Dated:

To,
General Manager (Power),
Gujarat Mineral Development Corporation Ltd
Khanij Bhavan,
132-Ring Road, Gujarat University Ground, Vastrapur,
Ahmedabad- 380052

Subject: No deviation certificate regarding Bid for Request for Proposal (RFP) Boiler and ESP Package for Overhaul of GMDC's 250 (2x125) MW Akrimota Thermal Power Station (ATPS), Gujarat

Dear Sir/Madam,

We _____ (Name of the Bidder), confirm our acceptance to all terms and conditions mentioned in the RFP document, and all subsequent clarifications, in totality and withdraw all deviations raised by us, if any.

We remain,

Yours sincerely,

Authorized Signature [In full and initials]:

Name and Title of Signatory:

Name of Firm:

Address:

Annexure 11: Format for power of attorney

(On stamp paper of value INR 300)

KNOW ALL MEN by these presents that we, _____ [name of the firm], a FIRM incorporated under the and having its Registered Office/ office at _____[Address of the Company] (hereinafter referred to as "Company/firm"):

WHEREAS in response to the RFP for _____ [Name of the Assignment] ("Project"), the Company/ firm is submitting Bid comprising Technical Bid physically while Price Bid through online submission for the project and GMDC and is desirous of appointing an attorney for the purpose thereof.

WHEREAS the Company deems it expedient to appoint Mr. _____ son / daughter of _____ resident of _____, holding the post of _____ as the Attorney of the Company/firm.

NOW KNOW WE ALL BY THESE PRESENTS, THAT _____ [name of the company/firm] do hereby nominate, constitute and appoint _____ [name & designation of the person] _____as its true and lawful Attorney of the Company/ firm to do and execute all or any of the following acts, deeds and things for the Company/ firm in its name and on its behalf, that is to say:

To act as the Company's/firm's official representative for submitting the Bid comprising Technical Bid and Price Bid for the said project and other relevant documents in connection therewith.

To sign all the necessary documents, papers, testimonials, applications, representations and correspondence necessary and proper for the purpose aforesaid;

To RFP documents, receive and make inquiries, make the necessary corrections and clarifications to the Proposal and other documents, as may be necessary;

To do all such acts, deeds, and things in the name and on behalf of the Company as necessary for the purpose aforesaid.

The common seal of [name of the company/firm] was here unto affixed pursuant to a resolution passed at the meeting of Committee of Directors held on _____Day of, 2023 in the presence of [name & designation of the person] and countersigned by [name& designation of the person] of the Company/firm of [name of the company]	_____ [name & designation of the person] _____ [name & designation of the person]

Annexure 12: Undertaking regarding geniuses of documents

(On stamp paper of value INR 300)

I/We,_____,Partner/Director/Legal Attorney/Accredited Representative of M/s. _____ solemnly declare that:

1. I/We are submitting Tender for the work_____ _____ against Tender No._____
2. None of the Partners/Directors of our firm/GMDC is relative of employee of GMDC.
3. All information furnished by us in respect of fulfillment of eligibility criteria and qualification information of this Tender is complete, correct and true.
4. All documents/credentials submitted along with this Tender are genuine, authentic, true and valid.
5. If it is found at any point of time that our documents are not genuine then in that case our tender will be rejected, earnest money deposited by us will be forfeited and we will be debarred from participating in further/future GMDC tenders and/or any action as deemed fit by GMDC may be taken against us, including termination of the contract, forfeiture of all dues including Earnest Money / Security deposit and banning/delisting of our entity and all related persons etc.

Dated this _____ day of 2023.

Signature

(Company Seal)

In the capacity of duly authorized to sign Bids for and on behalf of:

Signed by

Authorized Signatory with designation

Annexure 13: Undertaking of indemnity

(To be printed on Bidder's letterhead)

Dated:

To,
General Manager (Power),
Gujarat Mineral Development Corporation Ltd
Khanij Bhavan,
132-Ring Road, Gujarat University Ground, Vastrapur,
Ahmedabad- 380052

Dear Sir/Madam,

We M/s. ---------- hereby undertake that, we shall at all times, indemnify and keep indemnified that GMDC Limited from any and all liability for damages resulting from or arising out of or in any way connected with the operations covered by the Tender No. _____. We shall be responsible for all risk arising in connection with or on account of the operations covered by the contract covered by the above tender and shall make good all losses and damages arising there from. In case, the GMDC Limited shall incur any cost or expense or suffer any loss on account of any claim demand or course of action brought against us and arising out of the operations covered by the Bidder/tender, the GMDC Limited shall have the power (without being bound to do so) to define, contest or compromise any such claim demand or cause of action. Any amount that may become payable by GMDC Limited and any cost expense etc. that may be incurred by the GMDC Limited in this behalf, shall also be recoverable from us, without prejudice to your other rights.

We remain,

Yours sincerely,

Authorized Signature [In full and initials]:

Name and Title of Signatory:

Name of Firm:

Address:

Annexure 14: Indicative format of Price bid

(This is indicative format for Bidder's reference only. The PRICE PROPOSAL SHOULD BE SUBMITTED ONLINE ONLY at designated places through http://gmdc.nprocure.com. Price Bid should not be submitted in hard copy and or placed with Technical Bid. Prices submitted in hard copy and or placed with Technical Bid shall result in outright rejection of Bid)

Dated:

To,
General Manager (Power),
Gujarat Mineral Development Corporation Ltd
Khanij Bhavan,
132-Ring Road, Gujarat University Ground, Vastrapur,
Ahmedabad- 380052

Subject: Price Bid for Request for Proposal (RFP) for Boiler and ESP Package for Overhaul of GMDC's 250 (2x125) MW Akrimota Thermal Power Station (ATPS), Gujarat

Dear Sir,

After thoroughly reading and accepting the RFP terms, understanding the requirements, and scope of work under this RFP, and its terms and conditions, we hereby agree to provide our services at the following rates:

	Description	Total Amount (in INR, excl. GST)
A1	Boiler: Charges for Supply of material – Category 1	
A2	Boiler: Charges for Supply of material – Category 2	
A3	ESP: Charges for Supply of material	
A = A1 + A2 + A3	**Lumpsum Charges for Supply of material**	
B1	Boiler: Charges for Overhaul execution (Services) – Category 1	
B2	Boiler: Charges for Overhaul execution (Services) – Category 2	
B3	ESP: Charges for Retrofitting (Services)	
B = B1 + B2 + B3	**Lumpsum Charges for Overhaul execution**	
A + B	**Lumpsum Charges for Boiler and ESP Package**	

Note:

The Bidder to quote charges inclusive of all other taxes except applicable GST. Applicable GST, over and above approved Lumpsum Charges for Boiler and ESP Package, at the time of invoicing shall be reimbursed by GMDC. The risk of applicability of any taxes, duties, and levies except GST, shall rest with the Bidder.

GMDC shall be entitled to deduct tax at source as may be applicable. The TDS certificate(s) shall be submitted as per the due date specified in the Income Tax Act.

Each Bidder must quote their rates after through reading of this RFP document and estimates of its cost through detailed due diligence of the Plant, statutory laws/regulations. GMDC reserves right to seek any clarifications regarding price quoted from Bidders before any decisions.

Annexure 15: Format for Bank Guarantee towards EMD

Please note the following details for Compulsory e-confirmation for Bank Guarantee through ICICI Bank through SFMS under our:

Gujarat Mineral Development Corporation Limited (GMDC)
132 Ft Ring Road, Near University Ground Vastrapur, Ahmedabad.
Bank Name: ICICI Bank Ltd
IFS Code: ICIC0000024
UIC GMDC530265584 for Field 7037 MT760

(On Non-judicial Stamp paper to be submitted along with submission of bids)

……. (Name of the Bank)

Address…….

Guarantee No…….

A/C Messrs…….. (Name of Bidder)

Date of Expiry……

Limit to liability (currency & amount) ……..

Invitation For RFP No……. Dated…… (bidding document)

For……. (Name of Facilities)

Subject: Earnest Money Deposit Bank Guarantee.

Date……2023

To,

General Manger (____),
Gujarat Mineral Development Corporation Ltd.
132 Ft Ring Road,
Near University Ground
Vastrapur,
Ahmedabad.

Dear Sir,

In consideration of Gujarat Mineral Development Corporation (hereinafter called "GMDC") which expression shall unless repugnant to the subject of context include his successors and assigns having agreed to exempt M/s……. (herein after called "Bidder") from demand under the terms and conditions of "Technical

Bid Document" (hereinafter called the said "Bidding Document") issued by the GMDC vide RFP No._____for the work_____

(Name of the facilities) from Earnest Money Deposit (EMD) of Bid for the due fulfillment by the Bidder of the terms and conditions contained in the said Bidding Document on production of Bank Guarantee for INR _____

(_____ only) (figure in words).

1. We the _____ (Name of Bank) hereinafter referred to as "Bank" having our registered office at _____ (address of Bank) do hereby undertake and agree to indemnify and keep indemnified GMDC to extent of INR _____(_____ only) (figures in words) against any losses, damage cost, charges and expenses caused to or suffered by or that may be caused or suffered by GMDC by reason of any breach or breaches by the Bidder of any of the terms and conditions contained in the said Bidding Document and unconditionally pay the amount claimed by GMDC on demand and without demur to the extent aforesaid.

2. We _____ (Name of Bank) do hereby undertake to pay the amounts due and payable under the guarantee without any demur merely on a demand by you stating that the amount claimed is due by way of loss or damage caused to or would be caused or suffered by you by reason of any breach by the said Bidder of any of the terms or conditions contained in the said Bidding Document by reason of the Bidder's failure to fulfill the conditions of said Bidding Document. Any such demand on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding INR_____ _____.

3. We _____ (Name of Bank) further agree that GMDC shall be the sole judge of and as to whether the Bidder has committed any breach or breaches of terms and conditions of the said Bidding Document and the extent of loss, damages, costs, charges and expenses caused to or suffered by or that may cause to or suffered by GMDC on account hereof to the extent of the Bid Security required to be deposited by the Bidder in respect of the said document and the decision of GMDC that the Bidder has committed such breach or breaches and as to the amount or amounts of loss, damages, costs, charges, and expenses caused to or suffered by or that may be caused to or suffered by GMDC shall be final and binding on us.

4. We _____ (Name of Bank) further agree that guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance on the said Bidding Document and that it shall continue to be enforceable till you certify that terms and conditions of the said Bidding Document have been fully and properly carried out by the said Bidder and accordingly discharge the guarantee. Unless a demand or claim under this guaranteed is made on us in writing on or before the (date) _____ we shall be discharged from all liability under this guarantee.

5. We _____ (Name of Bank) further agree with you that you have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Bidding Document or to extend time of performance by the said Bidder from time to time or to postpone for any time or from time to time any of the powers exercisable by you against the said Bidder and to forbear or enforce any of the terms and conditions relating to the

said Bidding Document and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Bidder or for any forbearance act or omission on your part or any indulgence by you to the said Bidder or any such matter or thing whatsoever under the law relating to sureties would but for this provision have effect of so relieving us.

6. It shall not be necessary for GMDC to proceed against the Bidder before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank, notwithstanding any security which GMDC may have obtained from the Bidder at this time when proceeding are taken against Bank hereunder be outstanding or unrealized.
7. We _____ (Name of Bank) further undertake to unconditionally pay the amount claimed by GMDC merely on demand and without demur to the extent aforesaid.
8. We, the said Bank lastly undertake not to revoke this guarantee during its currency except with the previous consent of GMDC in writing.
9. This Guarantee will not be discharged due to the change in the constitution of the Bank or the said bidder.
10. The Bank has under its constitution power to give this guarantee and Mr. _____who has signed it on behalf of the Bank have authority to do so.

Yours faithfully

For……

(Name of the Bank)

Notwithstanding anything contained hereinabove

(I) Our liability under this Bank Guarantee shall not exceed **Rs _____/- (Rupees _____ only)**

(II) This Bank Guarantee is valid up to _____ (Date)**.**

(III) We are liable to pay the guarantee amount or any part thereof under this bank Guarantee only and only if you serve upon us a written claim or a demand on or before _____(date).

(IV) This bank guarantee is operative only when accompanied with SFMS advice from us.

Yours faithfully

For _____(Name of the Bank)

Yours faithfully

For……

(Name of the Bank)

Annexure 16: Format for Bank Guarantee towards Performance Security

Please note the following details for Compulsory e-confirmation for Bank Guarantee through ICICI Bank through SFMS under our:

Gujarat Mineral Development Corporation Limited (GMDC)
132 Ft Ring Road, Near University Ground Vastrapur, Ahmedabad.
Bank Name: ICICI Bank Ltd
IFS Code: ICIC0000024
UIC GMDC530265584 for Field 7037 MT760

Name of the Bank :

Address :

Guarantee No :

Name of the Bidder : M/s _____

Date of Expiry :

Limit to liability : Rs _____/- (Rupees _____ only)

Ref: RFP bearing No. _____

Subject: Bank Guarantee towards Security Deposit.

Date……2023

To,

General Manger (____),
Gujarat Mineral Development Corporation Ltd.
132 Ft Ring Road,
Near University Ground
Vastrapur,
Ahmedabad.

Dear Sir,

In consideration of Gujarat Mineral Development GMDC (hereinafter called "GMDC") which expression shall unless repugnant to the subject of context include his successors and assigns having agreed to exempt **M/s _____**(hereinafter called "Bidder") from demand under the terms and conditions of "Technical Bid Document" (hereinafter called the said "Bidding Document") issued by the GMDC vide RFP _____**. The present** Bank Guarantee is towards Security Deposit (SD) of Bid in terms of Clause No. _____ of Chapter – _____of the afore-said bidding document for the due fulfillment by the Bidder of the terms and conditions contained in the said Bidding Document on production of Bank Guarantee for **Rs _____/- (Rupees _____ only)**

1) We the _____ (Name of the Bank) hereinafter referred to as "Bank" having our registered office at _____ do hereby undertake and agree to indemnify and keep indemnified GMDC to extent of **Rs _____/- (Rupees _____ only)** against any losses, damage cost, charges and expenses caused to or suffered by or that may be caused or suffered by GMDC by reason of any breach or breaches by the Bidder of any of the terms and conditions contained in the said Bidding Document and unconditionally pay the amount claimed by GMDC on demand and without demur to the extent aforesaid.
2) We _____ (Name of the Bank) do hereby undertake to pay the amounts due and payable under the guarantee without any demur merely on a demand by you stating that the amount claimed is due by way of loss or damage caused to or would be caused or suffered by you by reason of any breach by the said Bidder of any of the terms or conditions contained in the said Bidding Document by reason of the Bidder's failure to perform according to the terms and conditions of said Bidding Document. Any such demand on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding **Rs _____/- (Rupees _____ only).**
3) We _____ (Name of the Bank) further agree that GMDC shall be the sole judge of and as to whether the Bidder has committed any breach or breaches of terms and conditions of the said Bidding Document and the extent of loss, damages, costs, charges and expenses caused to or suffered by or that may caused to or suffered by GMDC on account hereof to the extent of the Bid Security required to be deposited by the Bidder in respect of the said document and the decision of GMDC that the Bidder has committed such breach or breaches and as to the amount or amounts of loss, damages, costs, charges, and expenses caused to or suffered by or that may be caused to or suffered by GMDC shall be final and binding on us.
4) We _____ (Name of the Bank) undertake to pay to the GMDC any money so demanded notwithstanding any dispute or disputes raised by the said Bidder (s) in any suit or proceeding pending before any forum of law relating thereto our liability under this present being absolute and unequivocal. The payment so made by us underthis bond shall be a valid discharge of our liability for payment there under and the said Bidder (s) shall have no claim against us for making such payment.
5) We _____ (Name of the Bank) further agree that guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance on the said Bidding Document and that it shall continue to be enforceable till you certify that terms and conditions of the said Bidding Document have been fully

and properly carried out by the said Bidder and accordingly discharge the guarantee. Unless a demand or claim under this guaranteed is made on us in writing on or before the (date)_____we shall be discharged from all liability under this guarantee thereafter.

6) We _____ (Name of the Bank) further agree with you that you have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Bidding Document or to extend time of performance by the said Bidder from time to time or to postpone for any time or from time to time any of the powers exercisable by you against the said Bidder and to forbear or enforce any of the terms and conditions relating to the said Bidding Document and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Bidder or for any forbearance act or omission on your part or any indulgence by you to the said Bidder or any such matter or thing whatsoever under the law relating to sureties would but for this provision have effect of so relieving us. The Bank further agrees that in case this guarantee is required for a longer period, the bank may extend the same.
7) We _____ (Name of the Bank) further undertake to unconditionally pay the amount claimed by GMDC merely on demand and without demur to the extent aforesaid.
8) We, the said Bank lastly undertake not to revoke this guarantee during its currency except with the previous consent of GMDC in writing.
9) This Guarantee will not be discharged due to the change in the constitution of the Bank or the said Bidder.
10) The Bank has under its constitution power to give this guarantee and Mr. _____who has signed it on behalf of the Bank have authority to do so.

Yours faithfully

For……

(Name of the Bank)

Notwithstanding anything contained hereinabove

(I) Our liability under this Bank Guarantee shall not exceed **Rs _____/- (Rupees _____ only)**

(II) This Bank Guarantee is valid up to _____ (Date)**.**

(III) We are liable to pay the guarantee amount or any part thereof under this bank Guarantee only and only if you serve upon us a written claim or a demand on or before _____(date).

(IV) This bank guarantee is operative only when accompanied with SFMS advice from us.

Yours faithfully

For _____(Name of the Bank)

Annexure 17: List of approved banks for EMD, RFP fees, and Performance Security

The following list of banks can get updated from time to time as per the latest notice provided by the Government of Gujarat. The Bidder can provide EMD / RFP Fee / Performance Security from any of the approved banks by the Government of Gujarat in the latest notice, except for the co-operative banks

Acceptance of Bank Guarantee as Security Deposit and Earnest Money Deposit.

Government of Gujarat

Finance Department

GR. No.: FD/MSM/e-file/4/2023/0057/D.M.O.

Date: 21/04/2023

Read: FD GR. No.: EMD/4/2022/0002/DMO Dt. 20/05/2022

Preamble:

Tendering authorities of the State Government and its Boards/Corporations/PSUs frequently take Bank Guarantee from the bidders towards Security Deposit and Earnest Money Deposit. The State Government had issued the list of eligible banks vide above read resolutions of this department dated 20/05/2022.

After careful consideration, the Government has decided to approve the list of Banks whose Bank Guarantees would be accepted for the purpose mentioned above. It has now been decided to resolve as follows:

Resolution:

Government Departments and State Government Boards / Corporations / PSUs would accept Bank Guarantee (towards Security Deposit and Earnest Money Deposit) issued by any of the banks included in the **Annexure I**, attached to this Resolution.

The tendering authority will be required to ascertain the authenticity of the Bank Guarantee and set up necessary internal control procedures.

By order and in the name of the Governor of Gujarat.

(S. Chhakchhuak)
Additional Secretary (Budget)
Finance Department

To,

The Secretary to His Excellency Governor of Gujarat, Raj Bhavan, Gandhinagar
Principal Secretary to Hon. Chief Minister
PS to Hon. Finance Minister
PS to all Hon. Ministers, State Ministers and Deputy Ministers
PS to Chief Secretary
PS to Principal Secretary, Finance Department
PS to Secretary (EA), Finance Department
PS to Secretary (Expenditure), Finance Department
PS to Additional Secretary (B), Finance Department
All Administrative Departments, Sachivalaya, Gandhinagar
System Manager, Finance Department for put up on GSWAN website
Select File DMO-Finance Department

Annexure I.

Finance Department, GR. No.: FD/MSM/e-file/4/2023/0057/D.M.O.

Date: 21/04/2023

(A) Guarantees issued by the following banks will be accepted as SD/EMD on permanent basis:

- **All Nationalized Banks**

(B) Guarantees issued by the following Banks will be accepted as SD/EMD for the period up to March 31, 2024. The validity cut-off date in the GR is with respect to the date of issue of Bank Guarantee irrespective of the date of termination of Bank Guarantee.

Sr No	Name of Banks	Sr No	Name of Banks
1	AXIS Bank	17	Kotak Mahindra Bank
2	AU Small Finance Bank	18	South Indian Bank
3	Bandhan Bank	19	Standard Chartered Bank
4	BNP Paribas	20	Tamilnadu Mercantile Bank
5	City Union Bank	21	Utkarsh Small Finance Bank
6	CSB Bank	22	The Kalupur Commercial Co-op. Bank
7	DBS Bank India Limited	23	Ahmedabad Mercantile Co-op. Bank
8	DCB Bank	24	Nutan Nagarik Sahakari Bank Ltd.
9	Equitas Small Finance Bank	25	Rajkot Nagarik Sahakari Bank Ltd.
10	FEDERAL Bank	26	Saraswat Co-Operative Bank Ltd
11	HDFC Bank	27	SVC Co-Operative Bank LTD.
12	HSBC Bank	28	The Gujarat State Co-operative Bank
13	ICICI Bank	29	The Mehsana Urban Co-Op. Bank Ltd
14	IndusInd Bank	30	The Surat District Co-Operative Bank Ltd
15	Karnataka Bank	31	The Surat People's Co-Op. Bank Ltd
16	Karur Vysya Bank	32	Saurashtra Gramin Bank

All the eligible banks are instructed to collect the original documents/papers of guarantee from the concerned tendering authority.

(S. Chhakchhuak)
Additional Secretary (Budget)
Finance Department

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