



CETHAR VESSELS (P) LIMITED

103, R.K. HOUSE,
BEHIND SHILP BUILDING
C.G. ROAD, NAVRANGPURA
AHMEDABAD-380 009
INDIA
TEL: 079-26462583/26465940
FAX: 079-26402630
E-mail:
ahmedabad@cethar.com

CVL / RA - AML / NO / 2001 / 012

August 14th, 2001

To,

M/s. Arvind Mills Limited
Khatraj Chowkdi,
Village : Santej,
Taluka : Kalol,
Dist. : Gandhinagar

Kind Attention : Mr. D. J. Yadav / General Manager (Utilities)

Dear Sir,

Sub : Offer for the supply of One no 13 TPH (Net), 14.5 Kg/cm²(g) Pressure, Saturated Temperature Coal fired 'CETHAR FLUIDIX' Bi-drum type BFBC Boiler and its auxiliaries - reg.

Reference: Your inquiry letter Dated 21.07.2001

With reference to the above cited subject, we are pleased to submit herewith our offer for the supply of One no. of 13 TPH (Net), 14.5 Kg/cm²(g) Pressure, Saturated Temperature, Coal fired 'CETHAR FLUIDIX' Bi-drum type BFBC Boiler and its auxiliaries as desired by you.

For Comments & Clarifications, Technical specifications, Design basis, Scope of supply, Exclusions, Terminal Points, Price schedule and Terms & conditions, Please refer the enclosed annexure.

We trust the above is in-line with your requirement and in the meantime if you need any further clarifications please feel free to contact us.

Thanking you and assuring you of our best attention at all times.

Yours faithfully,
For CETHAR VESSELS (P) LIMITED

Arif Shah
(Kirit Parikh)
Regional Manager

REGD. OFFICE : 4, DINDIGUL ROAD, TIRUCHIRAPALLI-620 001, TAMILNADU, INDIA
TEL : 91-431-2482452/53/54 * FAX : 91-431-2481079
E-mail: try_cvtry@sanchamet.in * cvplmarketing@eth.net
Website : www.cethar.com





List of annexure

Annexure I	Comments and Clarifications
Annexure II	Technical Data Sheet
Annexure III	Water Quality requirement
Annexure IV	Scope Of Supply
Annexure V	Exclusions
Annexure VI	Terminal Points
Annexure VII	Fuel Storage System
Annexure VIII	Chimney
Annexure IX	Price Schedule
Annexure X	Estimated Steam Cost Calculation
Annexure XI	Terms and Conditions

Amif skah

ANNEXURE -I
Comments and Clarifications



01. We have considered coal as a fuel and submitted our offer.
02. We have considered 13 TPH (Net with feed water temperature of 40 °C) as MCR capacity of the boiler and submitted our offer but you can use pre heated water up to 100 Deg C.
03. As we have considered under bed feeding system where complete combustion takes place in the fluidized bed, we have not considered ash re-circulation system
04. Multi loop controllers.
05. We have not considered soot blower as it is not required for our boiler.
06. We have quoted optional price for the Chimney, Fuel Storage Bunker with Conveyor, Steam Line, Painting.
07. We have not quoted the following items as indicated in the enquiry specifications :
 - Deaerator
 - HP Dosing System
 - Blow Down Flash Vessels tank
 - Ash Handling System

Amik shah



ANNEXURE - II
Technical Data Sheet
Operating Parameters

01. GENERAL

- | | | | |
|-----|---------------------------|---|--|
| 1.1 | Type Of System | : | Fluidized Bed Combustion Boiler |
| 1.2 | Type Of Boiler | : | Bi - Drum Type Water Tube Boiler |
| 1.3 | Type Of feeding System | : | Pneumatic Under Bed feeding System |
| 1.4 | Type Of Water Circulation | : | Natural Circulation |
| 1.5 | Type Of Support | : | Bottom Supported |
| 1.6 | Applicable Design Code | : | Indian Boiler Regulation 1950 with latest amendments and ASME PTC 4.0 for efficiency calculation by indirect method. |
| 1.7 | Installation | : | Out door |

02. PARAMETERS OF BOILER AT MCR (Measured at Main Steam Stop Valve)

- | | | | | |
|-----|----------------------------------|----------------------|---|--|
| 2.1 | Steam Flow | Kg / Hr. | : | 13,000 (Net) |
| 2.2 | Steam Pressure | kg / cm ² | : | 14.5 |
| 2.3 | Steam Temperature | °C | : | Saturated |
| 2.4 | Feed water Temperature | °C | : | 40 - 100 °C |
| 2.5 | Ambient temperature | °C | : | 40 |
| 2.6 | Relative Humidity | % | : | 60 |
| 2.7 | Fuel | | : | Coal |
| 2.8 | Boiler Thermal Efficiency on NCV | | : | 80 ± 2 % |
| 2.9 | Recommended Fuel Size | | : | 100% less than 6 mm & should be free from foreign particles. |

3.0 FLUIDISED BED AND BED TUBES

- | | | | | |
|-----|-----------------------------------|----------------|---|--------------------------|
| 3.1 | Bed Cross Sectional Area | m ² | : | 10.64 |
| 3.2 | Total no. of bed compartments | Nos. | : | Four |
| 3.3 | Expanded bed height | mm | : | 800 |
| 3.4 | Distributor plate section | | | |
| - | Plate thickness | mm | : | 16 |
| - | Plate material specification | | : | Mild Steel |
| 3.5 | Air nozzle material specification | | : | Cast Iron |
| 3.6 | Fuel nozzle | | | |
| - | Pipe size | mm x mm | : | Ø 115 x 5.4 Thk. |
| - | Pipe material specification | | : | IS 1239 / Eqvt. |
| 3.7 | Bed tubes | | | |
| - | Tube size | mm x mm | : | Ø 51 x 4 thk. |
| - | Tube material specification | | : | BS 3059 Seamless / Eqvt. |
| 3.8 | Bed tube headers | | | |
| - | Header size | mm | : | 219.1 |
| - | Material specification | | : | SA 106 Gr.B / Eqvt. |

Amrit shah



- 3.9 Number of bottom ash drain points : One per compartment
- Pipe size mm x mm : Ø 115 x 5.4 Thk.
- Pipe material specification : IS 1239
- 4.0 FUEL FEEDING SYSTEM
- Type of fuel feeding system : Under Bed
- Type of feeders : Rotary Air Lock Feeder
- No. of feeders nos. : 4
- No. of feeders : One per compartment
- No. of feed points from each feeder: Two
- Type of feed control system : Variable Speed Dynodrive control
- Feeder rating kw : 1.5
- 5.0 FURNACE
- 5.1 Type of construction : Fin welded membrane wall construction
5.2 Tube size mm x mm : Ø 50.8 x 3.25 Thk.
5.3 Tube material : BS 3059 ERW / Eqvt.
5.4 Headers size mm : Ø 219.1
5.5 Header material : SA 106 Gr.B / Eqvt.
5.6 Fin material : IS 2062
5.7 Type of finning : Welded
- 6.0 DRUMS
- | | Steam Drum | Mud Drum |
|-----------------------------------|--------------------------------|----------|
| 6.1 Internal diameter mm : | Ø 1220 | Ø 760 |
| 6.2 Material of construction : | (--- SA 515 Gr.70/Eqvt.---) | |
| 6.3 Type of dished ends : | (----- Semi ellipsoidal -----) | |
| 6.4 Type of tube end connections: | (----- Expanded -----) | |
| 6.5 Type of steam separators : | Screen driers | -- |
- 7.0 BANK TUBES
- 7.1 Tube size (OD x THK) mmxmm: Ø 50.8 x 3.25
7.2 Tube material specification : BS3059 ERW/Eqvt.
- 8.0 AIR HEATER
- 8.1 Location : Down stream of Boiler Bank Tubes
8.2 Type and Arrangement : Multi tubular type with tubes arranged in staggered fashion.
8.3 Tube size mm x mm : Ø 60.3 x 2.34 thk.
8.4 Tube material specification : IS 1239 / Eqvt.
8.5 Flow medium
- Inside tubes : Flue gas
- Outside tubes : Air
8.6 No of air passes : Two
8.7 No of gas passes : Two
8.8 Casing Plate Thickness mm : 4
8.9 Casing Material Specification: IS 2062 / Eqvt.

Amif chah



- 9.0 DUCTINGS
9.1 Air ducting thickness mm : 4
9.2 Plate material specification : IS 2062/Eqvt.

10.0 DRAUGHT EQUIPMENT SPECIFICATIONS

		FD Fan	ID Fan	PA Fan
Type of the fan	:	(CENTRIFUGAL)		
Flow m ³ /sec	:	8.52	22.68	2.53
Total pressure mmwc	:	700	250	700
Medium	:	Air	Flue gas	Hot air
Temperature °C	:	40	170	225
Speed rpm	:	1440	1440	2940
Motor rating KW	:	90	75	30
Motor type	:	←-- Squirrel Cage Induction Motor --→		
Bearing lubrication	:	←----- Grease -----→		
Type of control provided	:	Pneumatically	Operated	Regulating
Quantity No.	:	One	One	One

11.0 FEED PUMP SPECIFICATIONS

Type	:	Centrifugal
Capacity m ³ /hr	:	23.00
Pressure head mwc	:	222
Motor rating KW	:	30
Speed rpm	:	2900
Quantity Nos.	:	Two (One working + one standby)

12.0 HEAT TRANSFER AREA

12.1 Water Wall	:	162
12.2 Bed Coil	:	74
12.3 Bank	:	411
12.4 Air Pre Heater	:	319

13.0 COAL HANDLING, CRUSHING SYSTEM

13.1 General

Material to be crushed	:	Coal
NCV of the fuel Considered for Bunker Design	:	5085 Kcal / Kg
Feed size of coal	:	- 150 mm
Product size required	:	- 6 mm

Amif Shah



13.2 GRIZZLY HOPPER :-

Feeding height	:	1600 mm
Size of grizzly opening	:	160 mm Sq.
Size of discharge outlet	:	450 mm Sq.
Material of Construction	:	M.S. Fabricated.

13.3 RAW COAL CONVEYOR :

Type	:	Inclined Ttrouging Conveyor
Belt Width	:	600 mm
Conveyor profile	:	18 Degree Inclined
Trouging Angle of Idlers	:	20 Degree
Hood	:	G.I. openable hood provided throughout the Length Of the conveyor
Trestles	:	Made out of MS Channels, angles and plates

13.4 HAMMER MILL :

Type	:	Swing Hammers type with Breaker Plates With open bottom
Machine Speed	:	900 RPM
Drive through	:	'V' belt drive
Breaker plate adjustment	:	Provided having screw handle
Bearings	:	Spherical Roller Type Bearings
Material Of Construction	:	Shaft - En - 8 Body - MS Fabricated Hammers - Mn - steel Breaker Plates - Mn - steel

13.5 VIBRATING SCREEN :

Type	:	Floor mounted, circular motion type
Size	:	1200 mm W x 2500 mm W
No. of deck	:	One
Deck opening	:	8 mm Sq. to separate +6 mm from -6 mm Made out of woven wire mesh of 3 mm dia.
Stretching	:	Longitudinal
Drive	:	Through 'V' belts
Bearings	:	Spherical Roller Bearings
Bearing Housings	:	Provided with felt seal, oil seal and labyrinth ring
Material of Construction	:	Shaft - En-8 Basket - M.S. Fabricated Bearing Housing - Cast Steel Screen Cloth - Spring Steel Springs - 55 Si 7

Amit shah



13.6 REFEED BUCKET ELEVATOR :-

Type	:	Centrifugal discharge, Belt bucket type
Size	:	400 x 750
Tensioning	:	Screw type. at the boot
Buckets	:	Seamless buckets, Capacity - 1.1 Ltrs.
Belting	:	Nylon, 315/3 3mm top and 1.5 mm bottom cover th. Grade - M24

13.7 PRODUCT BUCKET ELEVATOR :

Type	:	Centrifugal discharge, Belt bucket type
Height	:	12 Mtrs. C/C
Belt speed	:	1.2 Mtrs/sec
Tensioning	:	Screw type. at the boot
Buckets	:	Seamless buckets, Capacity - 4.8 Ltrs.
Head pulley	:	500 mm dia. X 450 mm W, Crowned
Hold Back	:	Silent Ratchet type provided
Tail Pulley	:	400 mm dia. X 450 mm W, Self cleaning type
Belting	:	400 mm W. Nylon, 315/3 3mm top and 1.5 mm bottom cover th. Grade - M24

Amif shah



ANNEXURE - III
Water Quality Requirement

FEED WATER

Hardness	ppm	max	:	1.0
PH at 25 °C			:	8.8 - 9.2
Oxygen	ppm	max	:	0.02
Total iron	ppm	max	:	0.05
Total copper	ppm	max	:	0.01
SiO ₂	ppm	max	:	1.0
Conductivity at 25°C	us/cm	max	:	10.0
Hydrazine residual	ppm		:	--

BOILER WATER

PH at 25°C	ppm	:	10.0 - 10.5
Phosphate residual	ppm	:	20 - 40
TDS	ppm	max :	2000
Specific electrical conductivity at 25°C	us/cm	max :	4000
Silica	ppm	max :	25.0
Sodium sulphite as Na ₂ SO ₃	ppm	:	20 - 40

Amif shal
..



ANNEXURE IV
Scope of Supply

BASIC BOILER :

Main Boiler

- Refractory Furnace cum membrane wall combustion chamber with bed tubes and headers.
- Risers and Down comers.
- Steam Drum & Mud Drum.
- Set of Bank Tubes connecting Drums.
- Feed Piping from feed pumps to Steam Drum.
- Blow down piping up to blow off valve.
- Air box with distributor plate, fluidizing air nozzles.
- Air ducting from forced draught fan from airpreheater and airpreheater to air box.
- Primary airlines and under bed fuel feeding system.

Boiler Auxiliaries

- | | | |
|--|---|-----------|
| • Forced draught fan with motor | - | One No. |
| • Induced draught fan with motor | - | One No. |
| • Primary air fan with motor. | - | One No. |
| • Feed pumps with motors on common base frame | - | Two Nos. |
| • Rotary Feeder with Variable Speed Dynodrive
Attachment and eddy Current Clutch | - | Four Nos. |
| • Pneumatically Operated regulating Power Cylinder
For FD and ID fan Damper Operation | - | Two Nos. |

Boiler Mounting and Fittings

- | | | |
|--|---|----------|
| • Main steam stop valve | - | One No. |
| • Spring loaded safety valve | - | Two No. |
| • Air vent valve | - | One No. |
| • Steam pressure gauge | - | One No. |
| • Feed line pressure gauge | - | One No. |
| • Isolation coke for steam and feed Pressure gauge | - | Two Nos. |
| • Condensing loop for pressure gauges | - | Two Nos. |
| • Direct water level gauge (Tubular type) | - | Two Nos. |
| • Isolation valves for Drum Level Transmitter | - | Two Nos. |
| • Mobery Level Switch | - | Two Nos. |
| • Drain valve for liquid limiter | - | One No. |
| • Isolation valve for blow off valve | - | One No. |

Amif shah



- | | | |
|--|---|------------|
| • Continuous blow down valve | - | One No. |
| • Intermittent Blow Down Valve. | - | One No. |
| • Bed coil header drain valve | - | Two No. |
| • Feed line check valve | - | Three Nos. |
| • Feed line stop valve | - | Two Nos. |
| • Manually operated regulating globe valve | - | One No. |

Controls And Instrumentation :

- | | | |
|--|---|--------------------|
| • Electrical panel consisting of starters, relays, fuses, and instruments supplied by Cethar | - | One No. |
| • controller which accommodate all require control loops and logic's for boiler control | - | As per requirement |
| Temperature Indicator | - | Three Nos. |
| • Thermocouples to measure Bed Temperatures And combustion chamber outlet temperature | - | Seven Nos. |

Bi metallic dial type steam mounted thermometer to measure

- | | | |
|--|---|---------|
| • Air temperature at the outlet of air-preheater | - | One No. |
| • Gas temperature at the outlet of air-preheater | - | One No. |

Dial type pressure gauge to measure

- | | | |
|----------------------|---|---------|
| • FD header pressure | - | One No. |
| • PA header pressure | - | One No. |

'U' tube manometer to measure furnace

- | | | |
|-------------------------|---|----------|
| • Pressure and air flow | - | Two Nos. |
|-------------------------|---|----------|

SAFETY INTERLOCK SYSTEM FOR THE BOILER

- When water level is very low ,all the fans will trip.

ELECTRICAL INTERLOCK SYSTEM

- Unless ID Fan is on, PA & FD fans will not run.
- Unless PA Fan is on, FD fan will not run.
- In the event of PA/ID fan tripping , Fuel feeders will not run.

Amir shah



AIR PRE HEATER

- Vertical Air preheater with ash chutes - One No

MECHANICAL DUST COLLECTOR

- Multi cyclone Mechanical Dust Collector with ash Chutes - One No.
- Rotary Airlock feeder for continuous removal of ash at the bottom of MDC - One

TREMA CYCLONE

- Two parallel pass Trema Cyclone.
- Rotary Airlock feeder for continuous removal of ash at the bottom of Trema cyclone

FLUE GAS DUCTING

- Boiler to Air preheater.
- Air Preheater to mechanical dust collector.
- MDC to Air preheater to Induced Draft Fan Suction Flange

SUPPORTING STRUCTURE

- Steel supporting structure for Air Preheater & Mechanical Dust Collector
- Steel Plate forms at Steam Drum top level, steam drum manhole access level, bank manhole access level.
- Furnace Refractory Casing & its Supports.

REFRACTORY

- Supply of refractory material.

INSULATION

- Supply of Mineral wool along with Aluminum Cladding to meet the insulation requirement up to Air Preheater.

Amil - shah



COAL HANDLING SYSTEM

- Supply of Grizzly Hopper
- Supply of Raw Coal Belt Conveyor
- Supply of Hammer Mill (Crusher)
- Supply of Vibratory screen
- Supply of Re-feed bucket elevator
- Supply of Product bucket elevator

Knif shed



ANNEXURE - V
Exclusions

1. All RCC work Wherever Required and Boiler house.
2. All earthing & lighting for boiler house.
3. Incoming & outgoing control & power cables for individual equipments (Optionally Quoted).
4. Approval for CEIG for all electrical works & control panel.
5. Lubricants including initial filling of oil in gear box, grease in bearing etc.
6. Bed material (crushed refractory of -3mm size) for minimum 5 start ups.
7. Charcoal & kerosene for minimum 5 start ups.
8. Fuel preparation, handling system and Bunker with outlet gate / supports.
9. Water treatment plant, Raw water & soft water storage tanks.
10. Feed water line from storage tank to suction of feed pumps.
11. Steam line from main steam stop valve to process center.
12. Drain, Vent, Blow Down and Safety Valve exhaust Piping from all individual valves.
(Quoted Optionally)
13. Chimney & Flue gas ducting between ID fan to chimney.
14. Final painting.
15. Transportation, Insurance, Taxes & Duties.
16. Unloading at site.
17. Spares for operation & maintenance.
18. IBR inspection, registration, & approval Liaison fees & fees at site.
19. Chemicals for Alkali Boil Out.

Anil Shah



ANNEXURE - VI
Terminal Points

Water	:	Suction flanges of feed water pumps strainer.
Air	:	Suction flange of FD Fan damper.
Flue gas	:	Outlet of ID fan.
Steam	:	Outlet flange of main steam valve on the boiler.
Fuel	:	Inlet of Raw Fuel Grizzly.
Ash	:	Outlet of <ul style="list-style-type: none">- Bed drain pipes.- Ash drain gate at the bottom of bank ash chute.- Outlet Ash Chute at the bottom of air pre heater.- Rotor airlock feeder at the bottom of MDC.- Rotor airlock feeder at the bottom of Trema cyclone
Drains & Vents	:	Outlet flange of <ul style="list-style-type: none">- Continuous blow down valve in drum.- Intermittent blow off valve in drum.- Bed tube header drain valve.- Water level gauges drain cock.- Level Transmitter drain valve.- Safety valves discharge flange.- Air vent valve.
Electrical	:	Incoming and outgoing power cables from all individual equipments.
Instrument Air	:	At one point nearer to the boiler in the boiler house.

Amif shah



ANNEXURE - VII
Fuel Storage System - Bunker

1.0 TECHNICAL SPECIFICATION

- | | | | | |
|-----|------------------------|----------------|---|--|
| 1.1 | Water Volume | m ³ | : | 82 |
| 1.2 | Plate Thickness | mm | : | 6 |
| 1.3 | Material Specification | | : | IS 2062 / Eqvt. |
| 1.4 | Bunker Storage | hrs | : | 8 to 10 coal having
NCV of 3800 - 4400 Kcal / Kg. |
| 1.5 | Stiffeners | | : | Provided |
| 1.6 | Ladders | | : | Provided |
| 1.7 | Gate | | : | Sliding Gate |

2.0 SCOPE OF SUPPLY

- 2.1 Supply of one no of bunker.
- 2.2 Supporting structure for the bunker from firing floor level.

3.0 EXCLUSION

- 3.1 All civil works including grouting of bolts.
- 3.2 RCC column upto firing floor level.
- 3.3 Final painting
- 3.4 Erection and commissioning.
- 3.5 Packing & forwarding , Transportation, Insurance, Taxes and Duties.

Amif chal
..



ANNEXURE - VIII
CHIMNEY

1.0 TECHNICAL SPECIFICATION

1.1	Top Diameter	mm	:	Ø 1750
1.2	Bottom Diameter	mm	:	Ø 2800
1.3	Height of the chimney	m	:	48
1.4	Corrosion allowance Considered	mm	:	3
1.5	Type of Support		:	Self supported

2.0 SCOPE OF SUPPLY

- 2.1 One no self supported MS chimney
- 2.2 Flue gas ducting from ID fan outlet to chimney of maximum 5 m length.
- 2.3 Lighting protection and aviation lamps.

3.0 EXCLUSION

- 3.1 All civil works including grouting of bolts.
- 3.2 All cables , earthing and earth pit.
- 3.3 Painters trolley
- 3.4 Final painting
- 3.5 Erection & Commissioning
- 3.6 Packing & Forwarding , Transportation , Insurance , Taxes and Duties.

Amif asl



ANNEXURE - IX
Price Schedule

Rs. In Lacs
13 TPH 14.5 Kg/Cm.Sq.

01	Basic Boiler)	
02	Air Preheater)	
03	Mechanical dust collector)	
)	
04	All Air gas Ductings)	
	- FD Fan to air Heater)	
	- Air Preheater to Furnace)	
	- Pa fan to furnace)	
)	
05	All Flue gas Ductings	)	85.00
	- Boiler to air Preheater)	
	- Air Preheater to MDC)	
	- MDC to ID Fan)	
)	
06	Necessary Supporting Structure & Platform)	
)	
07	Refractory, Related Material & Its Fixing)	
)	
08	Mineral wool insulation, Aluminium Cladding & its fixing.)	
)	
09	Cannopy over steam drum	)	03.00
10	Screw Feeder for Sludge	)	02.00
11	Trima Cyclone	)	10.00
12	Misc. Items)	
A.	Interlocking cables, earthing & cabling	)	02.00
B.	Blow down piping upto pit provided in boiler House.)	
)	
C.	Drain piping upto pit provided in boiler house)	
)	
D.	Safety valve exhaust piping to take exhaust steam out of boiler house roof.	)	01.00
)	
E.	Air vent piping to take exhaust steam out of Boiler house roof)	
)	
F.	ID fan to chimney ducting (Max. 10 Meters)	)	00.75

Amit shah



13	Multi Loop controllers for boiler logic and control Based with erection	)	11.00
14	Coal Handling System (Coal Crusher & Refeed Cycle)	)	10.00
15	Packing & Forwarding.	)	01.80
16	Excise Duty Approx.	)	To be reimbursed on actual basis
17	CST against " C " Form	)	To be reimbursed on actual basis
18	Transportation	)	04.00
19	Turnkey Erection & Commissioning	)	08.00
	- Labours		
	- Tools, Tackles & Consumables		
	- Site assembling		
	- IBR & Non IBR Formalities		
	- Lifting & Shifting of Equipments		
	- Supervision by our Engineer.		
20.	Supervision for above.	)	02.00
			=====
	Sub Total	:	140.55
			=====

For Customer's Scope

01.	Bunker - 60 m.cub. with cannopy , fuel conveyor 45 meters & screen.	)	10.00
02.	Steam line from main steam stop valve to existing station as erected @ 10 mtrs. With all formalities.	)	01.50
03.	All civil work for boiler, fuel handling system	)	06.00
04.	Consumables for startup of the boiler like : bed material, char coal, kerosene, wood etc.	)	01.00
05.	Final Painting	)	00.50
06.	Chimney	)	05.00
07.	Misc.	)	02.00
			=====
	Sub Total	:	26.00
			=====

Amif shah



Note :

01. Delivery for new boiler will be 7 Months.
02. Free lodging & boarding to be given to CVL Engineers.
03. Above figures are indicative only as per normal market practice.
04. Feed water connection & electrical main cable connection, lightning has to be considered by you.

For CETHAR VESSELS (P) LIMITED

(Kirit Parikh)
Regional Manager

Amif shah



ANNEXURE - X

Operating Expenditure for 13 TPH Coal fired FBC boiler

Fuel Considered : Indian Steam Coal

(A) Fuel Expenditure	Fuel : Indian Steam Coal
Operating Capacity (Kgs / Hr)	13,000
Specific Enthalpy (Kcal / Hr)	665
Feed Water Temp.	70
Enthalpy of Feed Water(Kcal / Hr)	70
Heat OutPut (Kcal / Hr)	7,728,500
Efficiency on NCV (%)	80
Heat InPut (Kcal / Hr)	9,660,625
Net Calorific Value (Kcal / Kg)	5,085
Operating Period (Hrs / Year)	8,280
Fuel Consumption Per Hour	1,900
Solid Fuel Consumption (Tons/Year)	15,731.22
Solid Fuel Price (Rs / Tonne)	1,400
Fuel Expenditure (Rs / Year)	22,023,715
(B) Power Expenditure	
Total Units consumed (kwh)	210
Operating Power Kwh	210
Power Rate (Rs./ Kw)	4.32
Operating Period (Hrs / Year)	8,280
Power Expenditure (Rs./Year)	7,511,616.00
(C) Water treatment Cost	
Water Required for The sysetm(m^3)	13,000.00
Condensate recovery + Recirculation	7,500.00
Make Up Water Required	5,500.00
Water Treatment Cost @ Rs.15/Klitr	82.50
Water Treatment Cost @ Rs./ Year	683,100.00

Amif sack

Amif sack



PAYMENT TERMS FOR ERECTION & COMMISSIONING

- 20 % of the order value as an advance alongwith LOI/P.O.
- 10 % of the order value against mobilisation of site.
- Balance 70 % with all applicable taxes and duties through divisible transferable confirmed irrevocable letter of credit to be established in any Commercial Bank at Tiruchirapalli on agreed milestone activities. The L.C. shall be opened at the time mobilisation.

09. INSPECTION :

Where the purchaser desires an inspection at the manufacturer's works, such inspection can be only for final inspection just before packing. The date of inspection shall be intimated by the manufacturer about two weeks in advance. If the purchaser fails to undertake inspection on such date intimated, manufacturer shall proceed for despatch under no obligation to the purchaser.

10. BOUGHTOUT ITEMS :

The purchaser shall indemnify the manufacturer for any delay arising from delay in the supply of specific make of sub-delivery insisted upon the purchaser where the manufacturer has no control over the delivery of that sub-delivery.

11. GENERAL LIEN

Manufacturer is entitled to general lien on goods in possession or despatched for all money due from the purchaser. Both under this contract or any other account and the manufacturer shall also be entitled to apply any money in hand under any contract or contracts.

12. WARRANTY

The boiler is warranted against malfunction arising out of faulty design, material and / or workmanship for a period of 12 months from the date of commissioning or for a period of 15 months from the date of dispatch whichever is earlier. This clause will be applicable if and only if recommendations on feed water is strictly adhered-to by the purchaser.

13. PERFORMANCE GUARANTEE: Refer Technical Data sheet.

14. HANDING OVER OF THE BOILER

The boiler shall be deemed to have been delivered, and commissioned as per manufacturer's scope and the vendor shall issue a certificate to that effect. On achieving the rated steam parameters at the time of commissioning. It shall be deemed that the performance tests have been completed by the manufacturer. Manufacturer stands no guarantee if the boiler is put to commercial use without the authorization of the manufacturer.

Amif shah



15. BOILER REGISTRATION

The boiler is manufactured as per Indian Boiler Regulations with latest amendments. One set of relevant documents and certificates signed by the Chief Inspector of Boilers of Tamilnadu will be forwarded to the customer. Subsequent formalities for registering the boiler with boiler inspectorate of the state concerned shall be completed by the purchaser at his cost.

16. CANCELLATION

Orders received and acknowledged shall not be canceled without the written consent of the manufacturer. The advance paid along with the order shall be fully forfeited in the event of cancellation of order. If manufacturing activities has commenced, you shall compensate us for the work already carried out on your behalf, in addition to forfeiture of advance.

17. JURISDICTION

All contracts between purchaser and manufacturer are deemed to be entered into at Tiruchirappalli and are therefore subject to the jurisdiction of the courts of Tiruchirappalli.

18. FORCE MAJEURE

This offer is subject to force majeure for causes beyond manufacturer's reasonable control such as riots, fire, earthquakes, flood, accidents, break-down of machinery war, government orders or restrictions, strikes, lock-outs, delay due to unavailability of labor, raw materials, wagons, shipping space etc.

19. The performance test will be conducted as per code BS-2885/ IS-8753/ASME PTC 'Indirect Method' if buyer desire.

20. EXCISE DUTY

Excise duty on all manufactured and finished bought out items will be extra to the purchaser's account at the rates applicable at the time of supply. The rates applicable will be as specified in the central Excise Tariff for the relevant items at the time of dispatch.

21. GENERAL

On receipt of the purchase order the terms and conditions specified in our offer shall be deemed to have been accepted by the purchaser except in cases when the purchase order specifies otherwise.

22. MODVAT

The excise duty relief available under MODVAT Scheme has already been considered in quoting our present prices. Please note that final excise duty on all our own manufacture items or finished bought out subcontracted items is excluded from our price. Such excise duty would be to purchaser's account extra to the quoted price at rates prevailing at the time of supply. We shall furnish our duplicate copy of the invoice/sub-vendors duplicate copy of the invoice/chartered accountant certificates as the case may be in support of our claim for the excise duty and for availing MODVAT credit.

Amif shah



23. CENTRAL/STATE SALES TAX

For the items dispatched from our shop/sub delivery stores sales tax shall be paid extra at actual. Structural, ducting, boiler mounting, fittings and boiler auxiliaries, sales tax paid by our vendors shall be reimbursed by the purchaser. These items are finished bought out items and shall be dispatched from sub-vendor's works directly to you on 'Sales in Transit' under 'E1' transaction. To avail this exemption from sales tax, you will supply necessary 'C' forms for the value of individual invoices and the sales tax paid on these items by us to our sub-vendors shall be reimbursed by you. Local taxes, octroi etc. If applicable shall be paid extra by the purchaser.

You shall furnish a Bank Guarantee for the differential value between TNGST and concessional sales tax before commencement of dispatch, conforming that 'C' forms for supplies effected up to the close of the financial year (i.e. March 31) will be issued before 31st May and for balance items within 60 days of completion of supplies. Alternately you shall furnish 'C' form for every invoice as soon as the invoice is received by you. In the event you are not furnishing 'C' form immediately after receipt of invoice, further supplies will be made with TNGST rate of sales tax.

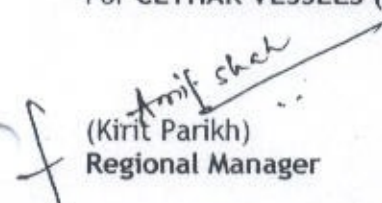
24. SPECIAL NOTE:

Please note that this offer is made strictly on the basis of divisible contract. The property in the goods shall pass to the buyer on the goods being handed over to the carrier for onward dispatch to site endorsement and way bills in your favour.

25. EXCESS MATERIALS

The excess materials send to site alongwith components for contingency and safe transportation purpose will be reused upto the maximum extent possible (or) taken back by CVL.

For CETHAR VESSELS (P) LIMITED


(Kirit Parikh)
Regional Manager