

HPCL-Mittal Energy Limited

GURUGOBIND SINGH REFINERY

SCOPE OF SERVICES

FOR

OPERATION AND MAINTENANCE

CONTRACT

FOR

CAPTIVE POWER PLANT

FY-2026 to FY -2031

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1. PROJECT DETAILS AND SCOPE OF O&M CONTRACT

1.1 Project details

HPCL-Mittal Energy Limited (HMEL) is a joint venture between Hindustan Petroleum Corporation Limited (HPCL) and Mittal Energy Investment Pte Ltd, Singapore - a Lakshmi N Mittal Group Company. HMEL is owning and operating Crude Oil Refinery of 11.3 MMTPA at Bathinda in Punjab, called Guru Gobind Singh Refinery Project. The refinery produces petroleum products complying with Euro IV & Euro VI emission norms. Crude Oil is received at this site through pipeline from Mundra (Gujarat) to Bathinda with Single Point Mooring (SPM) and Crude Oil terminal at Mundra. It has latest state of the art 165 MW captive power plant to meet its power and steam requirement. It was installed and commissioned by M/s BHEL.

HMEL has Captive Power Plant (CPP) consisting of 2 X Fr. 6 GTG sets + 2 x 110 TPH HRSG + 2 x 33 MW STG (Double Extraction) + 1 x 30 MW (BPSTG) + 4 x 240 TPH Utility Boilers + Balance of Plant + 2 x 300 TPH CFBC Boilers + Material Handling System Comprises of Pet Coke / Coal & Lime Handling + Ash Handling System. Hot water Belt exchanger and it's auxiliaries , Natural Gas heater for Refinery and Gas turbines. Delinking & EP12 Project

CPP has 220KV switchyard to receive power from PSPCL, Punjab. Switchyard has three transformers & other accessories to step down voltage to usable level for refinery and township sub-station. It has latest state of the art 33 KV GIS board to supply power to all sub-stations in refinery and it is located in sub-station-10.

The **Plant** is already under operation and its operation and maintenance (O&M) is being carried out by one reputed vendor in this field and supplying all agreed services to refinery units on continuous basis in effective manner. O&M operator of Plant have to do O&M using best practices as per the scope defined. O&M operator is supposed to operate and maintain PLANT in most Reliable , Efficient, Safe and Economic manner with a view to achieving optimum generation at minimum cost on one part and OWNER to organise and extend facilitation to meet its obligation within the contractual terms & condition on the other part.

The job scope presently includes complete O&M of CPP , CFBC and Material handling system as per attached Plot Plan .

O&M of existing CPP & CFBC Unit/MHS : To operate and maintain running CPP & CFBC consisting of two GTs, three STGs, two HRSGs, four UBs O&G, two CFBC Boilers, Fly / Bed Ash Handling System, weighbridge, Loading bed and fly ash, 220 KV switchyard & CPP , CFBC & MHS substation as per safety district /Layout and Hot water Belt exchanger and it's auxiliaries , Natural Gas heater for Refinery and Gas turbines. Delinking & EP12 Project It also includes all **material handling and**

storage system of Fly ash, Bed ash & Bed material as per Layout/ Operation & Maintenance of Pet Coke, Coal Handling System, Lime Handling & Grinding System. It includes all material handling, unloading through WT & Truck tippler and storage system & Rail track for coal, Petcoke, Limestone, as per scheme & Layout attached as Annexure including pipe conveyers, Ash Unloading and weighbridge O&M. Housekeeping staff for complete system attached as Annexures. The job scope includes operation, Maintenance, minor modification for plant improvements, Annual shutdown, Turn Around, Housekeeping with sufficient manpower including basic tools and consumables as per scope Matrix attached as part of Annexure.

Operation and Maintenance manpower should be on the Roles of Main O&M operator including the level of Control room engineers, shift Incharge & Maintenance engineers & senior Technicians, Field operators, and above.

ARC with OEM of CFBC Boiler/Megaldy system/Macawber Bk for quarterly reviews & quarterly Field visits for Monitoring, Training and guiding Operation. Man hrs may be tied up with OEM/Licensors accordingly. Other AMC/ARC should be as per scope Matrix.

1.2 SCOPE FOR O&M OF RUNNING PLANT:

The scope shall, inter-alia, include complete operations and maintenance of existing captive power plant including CFBC and MHS and all its equipment's within the safety district with adequate resources in place including all services required for O&M for planned and corrective maintenance including Annual Maintenance Contracts (AMC), basic consumables and tools/testing equipment, energy auditing, boilers IBR inspections, co-ordination with PSEB and any other services as per statutory, legal, Government requirements as may be required for operation, maintenance & Reliability improvement of the Plant.

Any other activity / services / materials apart from the scope mentioned as "Owners Obligations" shall be in completely in the scope of O&M Contractor.

Major Equipment of Part –A

- **Gas Turbine (2 nos.):**

Model: Frame 6B, Make: GE/BHEL, Supplied: BHEL Hyderabad, ISO Rating: 42.1 MW, Normal: 34.5 MW @ 5163 rpm, HSD as start-up fuel, LCO/Refinery Gas/Natural gas as Main Fuel, Startup means: Diesel Engine, Mark VI speedotronic Governing system, Water wash skid, Water Injection skid, False drain pit tank with Pumps, Gas conditioning Skid, Evaporator, Air filtration system with APU, Accessory Gear Box, Starting Mean with ratchet mechanism,

IGV, Dedicated Lube oil system, Atomizing Air cooler with DM water as cooling medium, Water to Water Heat Exchanger, DM water pumps for Atomizing air cooler, FRP cooling tower system for Black start operation with FRP cooling tower and FRP cooling tower pump for GT Auxiliary cooling. Earthing System for Gas turbine including shaft grounding.

- **Gas Turbine Generator (2 nos.):**

Make: BHEL, Supplied: BHEL Hyderabad, Rated Output: 43.125 MVA, 11KV, 0.8 PF (lag), 3000 rpm, 50 Hz, Brushless Excitation with PMG and DVAR, ECS and SCAP system supported.

- **Heat Recovery Steam Generator (2 nos.):**

Make/Supplied: BHEL Trichy

Type: Single Drum, Top supported, Horizontal, Independent Fuel Duct fired burners (7 nos. for RG and 12 nos. for LCO fuel resp.), Single Pressure, Natural circulation type with provision of supplementary firing, LCO as Main Fuel and Refinery gas as Alternative Fuel, MCR data: 107 Kg/cm² g, 110 TPH, 508 °C, Feed water temperature: 125 °C, Long retraceable type Soot blower (16 nos.), BMS Platform for Burners and DCS Platform for Controlling HRSG Parameters, Scanner fans (2 nos. – 1W + 1S), Augmenting air fans (2 nos. – 1W + 1S), Seal air fans (2 nos. – 1W + 1S)

- **Utility Boilers (4 nos.):**

Make/Supplied: BHEL Trichy,

Type: VU-60, Di drum, Bottom supported, Front Wall Firing, Forced draft, Natural circulation with Provision of Combination firing for all 08 nos. Burners, LCO as Main Fuel and Refinery gas as Alternative Fuel, MCR data: 107.5 Kg/cm² g, 240 TPH, 508 °C, Feed water temperature: 125.6 °C, BMCR data: 265 TPH, 107.5 Kg/cm² g, 508 °C, Feed water temperature: 125.6 °C, 10 nos. Long retraceable type Soot blower, 04 nos. of Rotary Soot Blowers, 01 nos. of Swiveling arm type SB, BMS Platform for Burners and DCS Platform for Controlling HRSG Parameters, Scanner air fan (2 nos. – 1W+1S), SCAPH, Rotary Regenerative Bi sector Horizontal type APH, HP Dozing system include common Metering and solution preparation tank and 02 nos. of HP dozing pumps (1W+1S) for each Boilers.

- **Steam Turbine with Double Extraction cum Condensing Type (2 nos.):**

Model: EEHNK 50/56-3, Make: BHEL, Supplied: BHEL Hyderabad, Rating: 35 MW @ 6300 rpm, Inlet steam parameter: 105 Kg/cm² g, 505 °C, Outlet Parameter: 0.075 Kg/cm² a, 40 °C, First Extraction details: HP steam, 40 Kg/cm² g, 380 °C, Second Extraction details: MP steam, 12.0 Kg/cm² g, 260 °C, 1+13 stages, Gear Box driver with ratio: 2.1:1, EHTC Block as governing block in DCS, DCS platform supported for Controlling and Safe Shutdown,

Barring gear (Electrical Motor + hand barring), Electrical Over-speed mechanism, Air Ejector (Hogger during startup), Primary and secondary steam Ejector with condenser (Vacuum pulling), Gland steam system with condenser, Condensate extraction pumps (2 nos. 1W+1S), Surface Condenser with Cooling water. Earthing System for Gas turbine including shaft grounding.

- **Steam Turbine Generator (02 nos.):**

Make: BHEL, Supplied: BHEL Hyderabad, Rated Output: 45 MVA, 11KV, 0.8 PF (lag), 3000 rpm, 50 Hz, Brushless Excitation with PMG and DVAR, ECS and SCAP system supported,

- Dedicated STG Lube oil system: MOT (10000 ltrs), AOP (02 nos., 1W + 1S, 01 steam driven and 01 AC motor driven respectively), EOP (01 nos.), Twin Cooler, Duplex Filter, JOP (01 nos.), Overhead tank

- **Back Pressure Turbine (01 nos.):**

Model: HNG 50/50-3, Make: BHEL, Supplied: BHEL Hyderabad, Rating: 32 MW @ 5000 rpm, Inlet steam parameter: 105 Kg/cm² g, 505 °C, Outlet Parameter: 5.0 Kg/cm² a, 400 °C, Gear Box driver with ratio: 1.67:1, EHTC Block as governing block in DCS, DCS platform supported for Controlling and Safe Shutdown, Barring gear (Electrical Motor + hand barring), Electrical Over-speed mechanism, Gland steam Ejector system with condenser

- **Backpressure Steam turbine Generator (01 nos.):**

Make: BHEL, Supplied: BHEL Hyderabad, Rated Output: 40 MVA, 11KV, 0.8 PF (lag), 3000 rpm, 50 Hz, Brushless Excitation with PMG and DVAR, ECS and SCAP system supported,

- Dedicated BPTG Lube oil system: MOT (8000 ltrs), AOP (02 nos., 1W + 1S, 01 steam driven and 01 AC motor driven respectively), EOP (01 nos.), Twin Cooler, Duplex Filter, JOP (01 nos.), Overhead tank

- **Gas Booster Compressors (2 nos.- 01 for each GT):**

Make: BHEL, Supplied: BHEL Hyderabad, Model: BCL 307, Medium: Refinery Gas, Inlet parameter: 10 Kg/cm² g, 50 °C, Outlet Parameter: 21.5 Kg/cm² g, 130 °C,

- UB Feed Water Pump (01 Steam turbine drive, 03 nos. Motor driven):-
Make: Sulzer, Model: GSG 150-360/9, 9 stages, Normal Capacity: 259 m³/hr, 125.7 Kg/cm² g, 125.6 °C, Rated Capacity: 302 m³/hr, 144.2. Suction pr: 2.42 Kg/cm² g, discharge pr: 144.22 Kg/cm² g, Motor drive: 1750 KW @ 2980 rpm,

NPSH: 6.6 m, Dedicated Lube oil system with 02 pumps (01 Motor shaft driven and 01 AC Motor driven LOP)

- HRSB Feed Water Pump (03 nos., 2W+1S, all Motor driven):-
Make: KSB, Model: CHTCR 3/9, 9 stages, Normal Capacity: 123 m³/hr, 130 Kg/cm² g, 125.6 °C, Rated Capacity: 136 m³/hr, Suction pr: 2.45, discharge pr: 149.18 Kg/cm² g, 910 KW @ 4000 rpm, NPSH: 7.9 m, Dedicated Lube oil system with 02 pumps (01 Motor shaft driven and 01 AC Motor driven LOP)
- Export Feed Water Pump (02 nos., 1W+1S, all motor driven):-
Make: Sulzer, Model: 150-360 D-1, Stages: 4 + 1 dummy, Rated Capacity: 328 m³/hr @ 62.05 Kg/cm² g and 125.6 °C, Normal Capacity: 253.5 m³/hr @ 53 Kg/cm² g, Dedicated Lube oil system with 02 pumps (01 Motor shaft driven and 01 AC Motor driven LOP)
- Deaerator with Feed water storage tank (02 no.):
Spray type Deaerator Vessel with Nozzle, LP steam as heating medium, Feed water storage tank: 420 m³ normal capacity, Common for all BFPs (09 nos.), Provision of dedicated LP dosing skid (ammonia and Hydrazine as separate skid having 02 pumps (1w+1s) in each skid)
- FD fans for Utility Boilers (04 nos., 01 for each boiler, fan driven by both Motor drive and Steam Turbine drive, Auto changeover of drive through high speed clutch):-
Make: BHEL, Supplied: BHEL Ranipet, Model: NDV 21, Centrifugal type, Design Capacity: 115 m³/s@ 50 °C, 1250 KW @ 1480 rpm (For MD drive), dedicate Lube oil system with sump and 02 nos. of Aux LOP (both Motor driven)
- **HSD Fuel Supply system:-**
 - i. HSD/ tank (01 no.), 200 m³ capacity each, internal floating roof type, HSD/ as fuel from Refinery
 - ii. HSD forwarding Pumps (Centrifugal type) for each GT having 02 nos. (1W+1S) with each of capacity 22.0 m³/hr flow @ 8.0 Kg/cm² g differential pressure, with dedicated downstream filtration skid for each GT.
 - iii. HSD centrifuge system having 03 nos. of forwarding pumps to dedicated centrifuge (2W+1S)
- **Naphtha Fuel Supply system: -**
 - Naphtha storage tank (01 no.), 200 m³ capacity each, internal floating roof type, Naphtha as fuel from Refinery

Naphtha forwarding Pumps-Gas Turbines (Centrifugal type- Kirloskar Ebara pumps) (2W+1S) with each of capacity 24.0 m³/hr flow

Naphtha forwarding Pumps for HRSG/Utility Boiler (Centrifugal type- Kirloskar Ebara pumps) (2W+1S) with each of capacity 13.0 m³/hr flow

- **LCO Fuel Supply system:-**

- i. LCO tank (02 nos.), 2200 m³ capacity each, Floating roof type, LCO as fuel from Refinery as FCCPU down run
- ii. LCO forwarding skid for GTs (Common) include LCO Forwarding pumps (Centrifugal type) 03 nos, (2W+1S, 01 for each GT) having capacity of 20 m³/hr @ 8.0 Kg/cm² g differential pressure, with dedicated downstream filtration skid and Vanadium Inhibitor skid for each GT.
- iii. LCO forwarding skid for UB include Forwarding Pumps (Screw type) 03 nos., (2W+1S, each capable for 02 nos. UB MCR operation) having capacity of 53.0 m³/hr flow @ 20 Kg/cm² g differential pressure.
- iv. LCO forwarding skid for HRSG include Forwarding Pumps (Screw type) 03 nos., (2W+1S, each capable for 01 nos. HRSG MCR operation) having capacity of 8.0 m³/hr flow @ 14.5 Kg/cm² g differential pressure.
- v. HSD/LCO drain tanks system with forwarding pumps for drain/condensate transfer to Slope header of refinery.

- **RG/FG supply system:-**

- i. RG/FG supply from refinery
- ii. RG/FG for GT includes 02 nos. gas scrubbers (2 X 50%), 02 nos. of GBC (2 X 50%), Gas conditioning skid include filtration and separation skid for each GT
- iii. RG/FG system for UB includes 02 nos. of Gas scrubbers (2 X 50%)
- iv. RG/FG system for HRSG includes 01 nos. of Gas scrubbers (1 X 100%)
- v. RF/FG drain tanks system include tanks and forwarding pumps for drain transfer to slope header of refinery and vent gas connected to Flare header of refinery
- vi. RFG steam heater & its accessories.

- **Natural gas supply system:-**

- Natural gas supply from GAIL -Gas receiving terminal (GRT) with capacity of 90 TPH flow max at pressure of 42 Ksc. Another GRT under commissioning.
- NG Gas Heater Refinery (575-EE-102A/B) 3.028 mmKCal/hr. Each. (Shell (NG) & Tube (MP steam) NG Heater Gas Turbine (575- EE-101A/B/C) 0.999 mmKCal/hr. Each. NG Heater condensate pot (575-VV-104/575-VV-103) Condensate Flash Vessel (575-VV-102), condensate transfer pump (575-PA-

102 A/B), fin fans, Vent condenser (575-ea-101) Natural Gas KOD (575-VV-101), Natural gas filter separator (575-GN-101A/B) & Its control system

- **Atomizing air compressor (03 nos., 2W+1S):-**

Make: Ingersoll rand, Type: Centrifugal, supplied: BHEL, Purpose: Atomizing air for UB for LCO/HSD fuel, Capacity: 4600 Nm³/hr @ 7.0 Kg/cm² g, 01 nos. of Storage receiver (20 m³), Emergency backup from Pressurized Atomizing air receiver (02 nos., 22 m³, 30 Kg/cm² g) with self-regulation Pressure reducing valve station

- Instrument Booster compressor (01 no.):-

Make: Ingersoll rand, Type: Reciprocating type, Supplied: BHEL, Purpose: Pressuring Atomizing air from 7.0 kg to 30 kg and storing the same in 03 receiver tanks (02 for emergency backup for UB atomization and 01 as Instrument air backup receiver for CPP as a blackout operation), Emergency IA include Air drier and Self-regulation pressure reducing control valve station before and after air drier.

- **HP Nitrogen Compressor (02 nos. 2 X 100%):-**

Type: Reciprocating Type, Supplied: BHEL, Capacity: 114 Sm³/hr @ Purpose: Pressurized the Nitrogen coming from Refinery from 8.0 Kg to 41 Kg/cm² g and stored them into receiver (04 nos., 25 m³ each) for GT system purging. This arrangement is take care of tripping of one gas turbine running on FG with one false start.

- **Cooling water system:-**

- i. Cooling tower: Make: 06 cells, Cross flow type, 2200 m³/hr capacity each having 01 nos of cooling tower fan (45 KW @ 1480 rpm) for each cell, Design COC – 5, Raw water as make up water from refinery, Blow down of CT to RO/DM unit of Utility, Separate chemical dosing skid provision for maintaining Cooling water parameter as per design
- ii. Cooling water pumps (02 nos., 1W+1S): Make: BHEL, Supplied: BHEL Hyderabad, Type: Centrifugal and vertical mounted, 7700 m³/hr @ 4.5 Kg/cm² g, 1800 KW @ 1440 rpm, Purpose: Dedicate CW to Surface condenser of both STGs only
- iii. Side stream filter system include SSF pumps (Submersible type, 2 stage, CF pump, 1W + 1S, 02 nos.) 330 m³/hr each @ 29 mmWC head for side stream filter with Air blowers packages.
- iv. Chlorination system and other chemical dosing monitoring.
- v. H₂SO₄ storage tank with unloading facility (MOC-2124) commissioning support

- Auxiliary Cooling water system:-

ACW Pump (3 nos., 2W+1S, 1 TD and 2 MD), Make: WPIL, Supplied: BHEL Hyderabad, Model: F20TC, 2 stage, Centrifugal type, Vertical mounted,

Capacity: 1633 m³/hr @ 58mWC, 360 KW @ 1480 rpm, Purpose: To supply ACW to complete BOP auxiliaries devices including sample cooler

- Black Start DG set:-
Make: GE, Supplied: BHEL Bhopal, Capacity: 2.8 MW, Diesel driven, Output Voltage: 6.6 KV to Emergency bus bar, Purpose: Black out operation and startup of GT
- Condensate Storage tank:-
200 m³, Purpose: Surge tank for incoming DM and TG condensate along with other refinery condensate, Dedicated LP dosing system (Ammonia) for maintaining pH of condensate entering to D/A
- MUH Transfer pumps (02 nos., 1W+1S, both Motor driven):-
Make: Flowserve, Supplied: BHEL Hyderabad, Model: 6HPX12A, Capacity: 243 m³/hr @ 101 mlc Differential head, 110 KW @ 2965 rpm, Centrifugal type, single stage, Purpose: To transfer the Condensate from condensate storage tank to Deaerator through Water pre heater / MUH module of HRSG (Last module of HRSG)
- Condensate Transfer pumps(03 nos., 2W+1S) 2 Motor driven 1 Turbine driven):-
Make: Flowserve, Supplied: BHEL Hyderabad, Model: 10HPX23A, Capacity: 929 m³/hr @ 92 mlc Differential head, 315 KW @ 1492 rpm, Centrifugal type, single stage, Purpose: To transfer the Condensate from condensate storage tank to Deaerator through LP heater
- EP2 PHE Shell & Tube side (575-EP-0-001) Design duty: 37.56*1.1 Gcal/hr. HWB circulation pump (575-P-HW-001A/B/C)320 M³/Hr. Expansion tank (575-HWT-00-001) Chemical dosing skid
- EP-12 PHE Shell & Tube side (575-EP-0-051) Design duty: 39.81*1.1 Gcal/hr. HWB circulation pump (575-P-HW-001A/B/C/D) 340 M³/Hr
- LP heaters (01 no.):
Shell and Tube of Heat exchanger, Purpose: To heat the condensate pump through Condensate transfer pump before going to D/A
Shell side details: Design Parameter Pr: 3 kg/cm² g, Temp: 150 Deg C, Corrosion allowance: 3.2 mm, Medium: LP steam
Tube side details: Design Parameter Pr: 12 Kg/cm² g, Temp: 150 Deg C, Corrosion allowance: 3.2 mm, Medium: Feed water, No. of tubes: 721, size: dia 19.05 OD * 20 AVG * 11940 length

- LP heater drain transfer pumps (02 nos., 1W+1S, both Motor driven):-
Make: Flowserve, Model: 4HPX11A, Supplied: BHEL Hyderabad, Design Flow: 120 m³/hr @ 68 mlc head and 106.5 deg C, Purpose: To transfer the LP heater drain collected in LP heater drain vessel to Deaerator
- Blow down system:-
 - i. Blow down for UB: Steam and water blow down to CBD and IBD vessel respectively, CBD drain to IBD and CBD vent to Deaerator, IBD drain to Blow down pit for UB # 1 and 2 and UB # 3 and 4 respectively, Blow down transfer pump from both UBs Pit to Main Blow down pit. Each UB Pit blow down transfer pumps (02 nos., 1W+1S), Make: KSB, Model: WKB 40/1 vertical pump, Single stage, design capacity: 18.5 m³/hr @ 23 m head
 - ii. Blow down for HRSG: Steam and water blow down to CBD and IBD vessel respectively, CBD drain to IBD and CBD vent to Deaerator, IBD drain to Blow down pit for HRSG # 1 and 2, Blow down transfer pump from HRSG Pit to Main Blow down pit. HRSG Pit blow down transfer pumps (02 nos., 1W+1S), Make: KSB, Model: WKB 40/5 vertical pump, 8.5 m³/hr @ 23 m head
 - iii. Blow down for STG: Steam header blow down to STG # 1, 2 and BPTG flash chamber, flash vessel drain to STG common blow down pit, STG blow down pit transfer pump to Main blow down pit. STG blow down pit transfer pumps (02 nos., 1W+1S), Make: KSB, 42 m³/hr @ 64 mlc head
- BPTG drain transfer pumps (02 nos., 1W + 1S):-
Make: KSB, Model: RPH HM 25-180, Rated flow - 5 m³/hr, head: 23 m, Purpose: To transfer BPTG integral drain from BPTG drain collecting vessel to Condensate storage tank
- BFTDT drain transfer pumps (02 nos., 1W + 1S):-
Make: KSB, Model: RPH HM 25-180, Rated flow - 5 m³/hr, head: 23 m, Purpose: To transfer BFPDT integral drain from BFPDT drain collecting vessel to Condensate storage tank
- Turbo Drive (Back Pressure type) units in CPP:
 - i. 01 nos., UB # 1 FD fan, Inlet: HP steam, Outlet: LP steam
 - ii. 01 nos., UB # 2 FD fan, Inlet: HP steam, Outlet: LP steam
 - iii. 01 nos., UB # 3 FD fan, Inlet: HP steam, Outlet: LP steam
 - iv. 01 nos., UB # 4 FD fan, Inlet: HP steam, Outlet: LP steam
 - v. 01 nos., UB Boiler feed pump, Inlet: HP steam, Outlet: MP steam
 - vi. 01 nos., UB LCO forwarding pump, Inlet: HP steam, Outlet: MP steam
 - vii. 01 nos., ACW pump, Inlet: HP steam, Outlet: MP steam
 - viii. 01 nos., STG # 1 MOP, Inlet: HP steam, Outlet: LP steam

- ix. 01 nos., STG # 2 MOP, Inlet: HP steam, Outlet: LP steam
- x. 01 nos., BPTG MOP, Inlet: HP steam, Outlet: LP steam
- xi. 01 nos., BFPDT MOP, Inlet: HP steam, Outlet: LP steam

- Chiller LCW2 series-Blue star Make 303 TR, VAM 255 TR Voltas make

- **CFBC Utility Boilers (2 nos.):**

Make/Supplied: ISGEC Heavy Engineering Limited (Foster Wheeler Technology),

Type: CFBC Water tube, Compact Separator, Single Drum, Top Supported, Natural Circulation, Balanced Draft, Outdoor, Front Bunker, Front wall feeding, CFB Boiler, 100% BMCR data: 110.0 Kg/cm² a, 300 TPH, 515±5 °C, Feed water temperature: 135 °C, 6 nos. Long retractable type Soot blower, 8 nos. of Short retractable Soot Blowers, HP Dozing system include common Metering and solution preparation tank and 02 nos. of HP dozing pumps (1W+1S) for each Boilers, 2 no. ID fans, 2 no. PA fans, 2 no. SA fans, two stage attempration system, Magaldi conveyor system for ash conveying, 2 Pass (parallel operation) ESP, 3 no. fuel bunkers, 4 no. gravimetric feeder, 4 no. drag chain feeder, 5 main burners (LCO/RFG), 6 bed lance burners (LCO/RFG) commissioning support for CAPEX projects MOC-2558 (Lime RAV Provision) MOC-2643 (Blaster arrangement for CFBC Fuel bunkers)

- **Ash Handling System: -**

Comprises of fly ash silo (2300 MT), bed ash silo (800 MT), 2 no. dry fly ash unloading sets, 1 no. wet fly ash conditioner, 2 no. dry bed ash unloading sets, 1 no. wet bed ash conditioner, compressor house {Fly ash compressor(3 Nos) Bed ash compressor (3 Nos) Lime stone compressor (3 Nos) Instrument air compressor (3Nos)] for ash conveying, ash handling and weigh bridge Further weighbridge handling activities include calibration in every 15 days, maintaining 2 printers along with cartridge, maintaining all consumables for weighbridge operation, Annual calibrations and compliances.

- Control & Instrumentation system comprising of:
 - DCS based boiler control system.
 - Safety PLC SIL3 for Burner Management System and HT Drives Trip.
 - Soot Blower PLC
 - Historian System, HART Management System, Master Clock System, Interposing Reply
 - Data Concentrator System, Power Distribution Panels.
 - UPS System
 - Gas Detection System
 - Sox, NO_x, CO, CO₂, SPM and O₂ analyser in flue gas path.
 - Vibration monitoring system for HT Drives.

- Steam & Water Analysing System (SWAS).
- Instrumentation cabling up to DCS Marshalling Panel.

Electrical System comprising of:

- HT/LT drive motors for Boiler feed pump, PA fan, SA fan, ID fan, fuel feeders
 - HP/LP chemical dosing system.
 - VFD for Fuel Feeders.
 - MCC for Boiler, ESP, Soot Blowers and Emergency power.
 - PCC for Boiler
 - PCC & ACP for ESP.
 - 6.6kv common service switchgear.
 - 6.6 kV | 0.433 kV Service Transformers for Boilers & ESP. Lightning Transformers for Boilers.
 - Normal & Emergency MLBD for Boiler & ESP.
 - Boiler valves and damper distribution board.
 - 220 V DCDB for DC Loads of Boiler.
 - LT power and control cables from boiler & ESP auxiliaries to MCCs and vice versa.
 - Electrical actuators for valves as applicable
- DCS:-
Name: maxDNA, Make: BHEL, Technology: Metso USA, Supplied: BHEL EDN, Communication network: Hardwire and MODBUS, Console: 24" TFT screen, Alarm Annunciation and Management system (AIMS), Historian, STG Control panel: 16 Nos. & SLSS.
Soot blower control panels: 05 nos.
BOP control panels including Boiler control: 45 nos.
 - Equipment like RFG Heater, Naphtha Fuel Conversion of GT and VHP/MP PRDS and other MOCs for reliability improvement within the Plant premises.
 - BMS PLC:-
Make: Honey well (India), Supplied: BHEL Trichy, Technology: Safety Manager with TMR technology, HRSG BMS Panel – 6 Nos. for each HRSG (Total – 12 nos.), UB BMS Panel – 11 Nos. for each UB (Total – 44 Nos.)
 - Control room:-
HVAC system, PA system, Walkie talkie, F&G system, engineering work station, SCAP Panels, Control Panels, ECS Panels,
 - EOT cranes:-
 - i. GTG House – 01 no

- ii. STG floor – 01 no
- iii. GBC room – 01 no
- iv. Boiler feed pump room – 01 no
- v. Fuel forwarding pump house – 01 no
- vi. CW pump house – 01 no
- vii. DG set house – 01 no
- viii. Atomizing air compressor house – 01 no

- CPP substation No-10 consists of major equipment

Total number of 33KV GIS - 64 Nos. (ABB make)

Total number of 6.6KV Switchgear - 90 Nos. (BHEL make)

Total number of 415V Switchgear - 352 modules (L&T)

220V, 400A, 805AH battery charger/battery bank

220V, 210A, 650AH battery charger/battery bank

125V, 75A battery charger/battery bank and Lighting Transformer and Data concentrator panels, FA systems, AC system, Ventilation system, C&I DCS Panels etc. Substation earthing system.

- Total no. of 11kv/33KV Generator Transformer - 05 Nos.
- Total No. Of 33KV/6.6KV Transformers - 04 Nos.
- Total No. Of 6.6KV/415V Transformers - 12 Nos.
- 3 Nos. of UPS.
- CPP Elevator.
- Electrical control system-ABB Make for Generation and load management and associated RTU's in SS-10 and downstream substations.

CFBC substation 9, 29, 30 No- consists of major equipment:

- Total No. Of 33KV/6.6KV Transformers - 02 Nos.
- Total No. Of 6.6KV/415V Transformers - 15 Nos.
- VFD Transformer 6.6KV/690V - 1 Nos.
- 220V, Battery charger/battery bank - 3 Nos.
- Total number of 6.6KV Switchgear - 87 Nos. (ABB make)
- Total number of 415V Switchgear - 17 Panels (L&T)
- 4 Nos. of UPS
- Elevator 4 Nos.

Battery bank, ACDB/DCDB and Lighting Transformer, Lighting Distribution board and Data concentrator panels, FA systems, AC system, Ventilation system, C&I DCS Panels etc. Substation earthing system.

220KV switchyard:

Refinery switchyard bay (1,2,3,4,5) and township bay (6 & 7) with 2 PSEB Incomers at 220 KV and 3 Grid Transformers 220KV/33KV , 50 MVA , Lighting and earthing system, Building lighting and SCADA system, PLCC, Aux. Distribution Panels, AC System, FA system, Firefighting and sprinkler system , Battery charger system etc. Township substation bay at 220 KV switchyard.

Major Equipment Part –B

- **Material Handling System (MHS):-**
25 TIP/hr wagon tippler with 2000 TPH apron feeder/dribble feeder, truck tippler with 2000 TPH apron feeder/dribble feeder, 2000 TPH Primary Crusher, 200 TPH Secondary Crusher, 2 x 200 TPH Flip Flop Screens, Coal Silos (2 no., 6000 ton each) with paddle feeder/RSFD/RBFD), 80 TPH Lime grinding system with ball mill/Crusher system / hot air generation / auxiliaries, Lime Silos (2 no., 2500 ton each), Belt Conveyors, Pipe Conveyors, VFD drives Dust Extraction System, Dry Fog Dust Suppression System, Rail track-1/2/3 maintenance . Petcoke silo, Pipe conveyors and V ploughs at Boiler Bunkers , Air compressors and lime stone open yard. SS-30 HVAC substation ventilation, Lift fire fighting network and related equipment's Panel, DV etc. PA communication system Plant monitoring cameras. Auxiliary COOLING TOWER for Ball mill wagon tippler EOT at JNT-1,2,3 4.Commissioning support of CAPEX MOC-2365 (V plough installation at BCN-2)

2.0 SERVICES:

The O&M Contractor shall operate and maintain the Plant to meet the design/proven requirement of steam, Power and other performance parameter including emissions as per the design. O&M Contractor shall operate and maintain the Plant and ensure that Plant Reliability is continuously improved and Plant is optimized to the best possible means, loss control mechanism is in place and failures are analysed , actions are taken to avoid repeat failure. O&M operator need to ensure that all AMC, consumables and other resources are also arranged timely.

2.2 Operation Phase Services

2.2.1 During the Operation Phase of the Plant, the O&M Contractor shall perform the O&M Services related to the Plant scope mentioned , including but not limited to the following:

- 1) **Staffing Plan.** The O&M Contractor shall establish and maintain a complete roster of staff at the Plant in accordance with the Staffing Plan and organizational chart which

shall include the qualification summaries and evidence of any certification granted. Regular training need to be carried out including training for owners Engineers at site. Further external services like housekeeping need to be planned and organized. Mechanized housekeeping shall also be in the scope of O&M Contractor, which should include heavy duty wet and dry vacuum cleaners, high capacity walk behind scrubber driers, hot and cold water high jets and road sweepers. These should be deployed along with necessary cleaning agents and other consumables. Sufficient numbers of such machines should be deployed all over CPP to carry out cleaning .

2) **Operating Services** –operations and service functions as may be reasonably required for the operation of the Plant in accordance with its obligations under the O&M Contract. The services involves delivery of steam and power as per Refinery requirements. In case at any stage Owner enters into a PPA with third party /trading agencies/Exchange for export of surplus power, O&M Contractor shall support Owner to carry out all necessary functional services. The O&M Contractor shall also undertake annually performance testing of the Power Plant to assure its long-term performance as mentioned elsewhere in the contract.

O&M Operator to ensure adequate resources including procedures to ensure reliability and efficiency of the Plant . Operation to implement Process safety management Pillars and safety systems like HIRA to ensure safe and reliable plant .

Coal shall be used only for startup/shutdown and reliability issues of CFBC , CPP mostly shall run with RFG ,NG , Liquid fuel and Petcoke. O&M team to support the execution team for permits and other related activities of commissioning of all MOCs. Minor modification related to improvement with the available resources should be done by O&M contractor.

O&M Contractor shall include training of HMEL manpower in the training calendar for onsite and offsite training at OEM works. Travel/Boarding/Lodging for the same shall be managed by HMEL. In case of external training 10 Owners Engineers have to be trained for 3 weeks in batches on various aspects of CFBC , GT, STG , Material Handling system , Pumps , Control system , DCS and BMS System etc. for next 5 (five) Yrs. (30 Man weeks /Annum) at OEM works or Plants with similar systems.

Coal- Normally is arranged through Wagons and unloaded at Wagon Tipler
Lime stone – Normally is arranged through Wagons and unloaded at Wagon Tipler
Petcoke – Normally transferred through existing Belt and Pipe conveyers upto Bunkers.
Bed Material – Unloading from Truck to be done safely and further transfer to bunker through EOT and pneumatic conveying available at site.

Material handling equipments may be required in case of delay of LIME or Coal to maintain minimum stock in Open yard by unloading from Wagons through Porklain & Hyd dumpers and unload back through Truck tippler . PI refer scope Matrix.
O&M operator should have Annual rate contract to mobilize the same on need basis contingency.

2.2.2 Mechanical: (Vendors mentioned anywhere indicates Bidder scope)

1. Except welded PSV, overhauling of all PSV will be in HMEL scope.

2. Scaffold / rope access requirement for all jobs including CIVIL (e.g. civil job such as roof sheet repair/ drainpipe repair) will be in Vendor scope.
3. Scaffold erection and removal in CFBC boiler must be done in maximum 5 days. Accordingly, type of scaffold or any alternate method must be chosen.
4. Scaffold for dry ice cleaning and other maintenance aspect inside HRSG will be under Vendor scope.
5. Inspection by drone inside CFBC furnace and compact separator area will be under vendor scope.
6. Hydra requirement for any type of maintenance will be in Bidders scope up to hydra capacity of 14 ton. Wherever crane services are required that will be in HMEL scope either due to space/ location constraint or due to loading capacity.
7. Insulation services and material (doesn't cover refractory) will be in HMEL scope, but bidder will keep one manpower always available at site for minor insulation removal and fixing with existing material. All the scaffold related to insulation will be in Bidder scope.
8. As HRSG insulation is specific, in that case cladding sheet, anchor rod and locking nut fixing will be vendor scope.
9. All supervision services for insulation will be vendor scope.
10. All types of near misses and safety related points for operation and maintenance flexibility, closure will be in vendor scope, required material for execution of the same will be in HMEL scope.
11. Replacement of existing piping or any other accessory with same nature piping/ equipment will be in vendor scope.
12. HMEL will provide 2 Vulcanizing machine of 2400 and 1400 mm width and 01 winch machine of 10Ton capacity, its future maintenance wrt services and spares will be in vendor scope, else vendor must arrange vulcanizing machines and winch machine for all set-ups.
13. Except above stated vulcanizing machine, all other sizes and any other set-up will be in vendor scope.
14. Lube oil and hydraulic oil filtration/ ELS machine will be in vendor scope wrt services and spares of machinery. NAS value 7 and less to be maintained for all the oils. Oil testing from external LABS as per HMEL approved procedure will be in vendor scope.
15. Stenciling will be under vendor scope for all existing set-ups.
16. Except BHEL/BGGTS all other OEM services shall be in vendor scope. Necessary ARC related to CPP/CFBC/MHS shall be lined up within 2 Months of PO award.
17. Residual life assessment as per IBR guidelines shall be carried out by vendor with all resources including implementation of recommendations . Spares shall be arranged by Owner
18. Vendor to arrange single phase 110 V welding machine/ Grinding machine & Hilti machine for confined space jobs./All temp equipments as per Safety standards defined by HMEL
19. All consumables will be under vendor scope, O-ring for MHS hydraulic system and fittings up to 3/4" size, must be arranged by vendor for daily routine task/ defects- max to INR 50000/- on annual basis.
20. Material PR request in HMEL approved format with proper justification must be given at least 12 months prior to planned requirements for procurement.

21. All manpower must go through validation process by HMEL engineer even if the same contractor going to be continued, all manpower must go for re-validation by respective area Engineers/ Managers.
22. Vendor must arrange Pneumatic/hydraulic torquing device – minimum 2 nos at site for all the critical service flanges, ball mill liner bolts torquing etc.
23. Vendor must arrange 2 set of laser alignment kit with trained people to execute the alignment job.

2.2.3 Electrical:

1. All miscellaneous minor improvement jobs arising from plant reliability improvement suggestions, RCM study, audit recommendations, RCA recommendations and shutdown support shall be in contractor's scope.
2. O&M contractor shall have ARC with Electrical Sub-Contractor to carry out miscellaneous electrical jobs as & when required for maintenance activities (Cable laying, earthpit installation/removal etc.). During emergency jobs, HMEL electrical contractor manpower can be utilized however service cost will be in scope of O&M contractor.
3. O&M contractor to ensure availability of competent manpower for HVAC & motor overhauling at site.
4. Major support, supervision & progress tracking required with MOC & new jobs (Capex).
5. SF6 gas testing is in the scope of O&M contractor.
6. All types of ladders (FRP, aluminum etc.) for substations/field/switchyard jobs shall be in scope of O&M contractor
7. Consumables: following consumables to be added in O&M contractor's scope. (We will share the detail list separately)
 - a. All the consumables related to AC, HVAC, chiller, and ventilation blower (including blower belts of all types, refrigerants etc.) is in scope of O&M contractor. However, compressors used for Tower AC, Package AC & HVAC is in scope of HMEL.
 - b. All types of nut bolt/washers/screws
8. APM bases ODR routes to be conducted by O&M contractor as per schedule
9. In recent past number of new predictive monitoring systems are installed or planned to be installed in CPP, CFBC, MHS and 220KV switchyard area for health monitoring of electrical assets. Various activities e.g. daily readings, installation & commissioning support, troubleshooting & maintenance support to vendor, rectification of observations etc. to be carried out by O&M contractor. Following are few of the systems ;
 - a. Battery Health Monitoring System (GTG-2 Battery Bank)
 - b. Earthpit Monitoring System (GTG-1 Mark VI & GTG-2 Mark-VIe Panel Earth pit)
 - c. GTG Temperature Monitor (GTG-1 & 2, and associated transformers)
 - d. GTG PD Monitor (GTG-1)
 - e. Generator Shaft Voltage Monitoring System (GTG-1)
 - f. HT Cable Continuous PD Monitoring System (For SS#26 feeder)
 - g. Dissolved Gas Analysis System (Grid-1 Transformer)
 - h. Network Disturbance Recorder (NDR) for 220KV switchyard
 - i. Online PD monitoring system of Grid-1 & 2

10. O&M contractor to execute/coordinate & provide support for performing various time based online & offline diagnostic testing. Few of them are as follows:
 - a. Online PD testing of Power Transformers
 - b. Tan delta testing of transformers
 - c. Online PD testing of 33KV cables
 - d. LEAP testing of HT motors
 - e. MCSA testing for HT motors
 - f. Tan delta testing of HT motors
 - g. Offline testing of cables (Tan delta & PD)
 - h. Online PD monitoring of HT switchboards
 - i. Online PD measurement (UHF, TEV) of GIS panels
11. We are in process of replacing all the conventional (HPMV, HPSV, fluorescent etc.) lights with LED lights. These lights will be replaced in coming future in a phased manner as part of Capex. O&M contractor to provide dedicated manpower to replace these lights so that the activity can be completed on time as per Capex timelines. Material will be provided by owner, and all the services are in the scope of O&M contractor. This is in addition to routine lighting maintenance, repair & replacement activities.
12. PSTCL is planning to shift the 220KV lines from Mansa substation to Behman Jassa. O&M contractor to extend his support in installation & commissioning of new communication system at HMEL end. Services of OEM shall be arranged by HMEL for commissioning of this communication system.
13. HMEL is in the process of importing green energy through open access. All the Liaisoning related to open access shall be in contractor's scope in addition to routine Liaisoning activities.
14. Overhauling of 220KV circuit breakers is in the scope of O&M contractor.
15. All control cable, earthing cable, communication cable and LT power cable (up to 3.5/4Cx70sqmm size) laying and its glanding & termination is in the scope of O&M contractor. (For MOC & reliability improvement activities)
16. New earthpit installation & replacement of earthpit is in the scope of O&M contractor.
17. Number of equipments/systems are getting obsolete and will be replaced/retrofitted in coming future in a phased manner as part of Capex. Execution/support for replacing/retrofitted of these equipments/systems which have become obsolete is in the scope of O&M contractor.
18. Data backup to be shared with HMEL to prevent loss of data.
19. Cable route survey (including 33KV cable up to refinery power transformer), repair, thermography of joints, HT cable route earth pit maintenance as per defined battery limit of cables.
20. 33 KV cable removal from GIS and re-termination in GIS during diagnostic testing of cables.
21. Associated activities (e.g. slab removal of cable trench, scaffolding etc.) for cable laying of MOC/RCA/RCM recommendation implementation shall be in O&M scope.
22. Repair of Cable Trays / Supports / Structure.
23. ECS system operation and maintenance up to downstream RTU panels is in O&M contractor scope. OEM expert in HMEL scope.
24. Draftsman for drawing updation in AutoCAD.

25. EDG - Services for Engine, alternator & control system
26. Dedicated vehicle for Liasoning with PSPCL (Patiala & Ludhiana in Owner's scope; rest locations are in O&M scope)
27. Annexure-D II (Min. Qualification & Experience):

Housekeeping :

Housekeeping and upkeep of Plant equipment is important for safety and reliable operation. O&M operator to ensure that the equipment's are maintained as per their basic condition & the operating areas are free from obstacles /unwanted consumables/spares/tools.

Critical areas are Crusher, Boiler, JNTs, MHS, Silo, Turbine /Drive Turbines, GT Enclosures, Lube Oil skids, Fuel systems. These all should be free from dust & spillage and should be maintained well with systematic schedule. This includes removal of spilled coal and cleaning and sweeping of coal dust from all conveyors, conveyor galleries, crusher house, stacker re-claimer area, all JT's, bunker floor, building and equipment, duplex feeder, chutes, sump pump pits, minus level area of reclaiming hoppers, de-watering of CHP, cleaning of coal from drainage system, head and tail pulleys of various conveyor belts, removal of chocking of coal from chutes, crushers, roller screens, stacker re-claimer .Similarly, all the equipment should be kept in cleaned condition all the time to facilitate easy inspection and good working condition. Similarly, Turbine /Drive Turbines, GT Enclosures, Lube Oil skids, Fuel systems shall be free from dust & spillage and should be maintained well with clear schedule.

Mechanized equipment's to be used for housekeeping including Industrial vacuum cleaners, Road cleaner, Plant and Building floor cleaning equipment's including consumables. All the manpower & mechanized equipment including consumables required to maintain the area shall be in the scope of O&M operator and to be mentioned separately in the organogram.

Bob-cat-1 nos. (Registration date at any time should be more than 5 years during the span of contract.) Small Hydraulic Dumper-1 nos.(Used by BRO at hilly area for material handling)-Do (At any case, tractor trolley is not allowed), Forklift for unloading Bed material and load shifting within the battery limit.

4) Maintenance and Corrective Services. The O&M Contractor shall develop systems towards reliability-based maintenance .Develop plans, schedule and procedure to demonstrate RCM. However, any corrective maintenance required to be carried out to the Plant shall be done by O&M Contractor. O&M Contractor shall regularly evaluate operation reliability and availability by calculating Indices i.e. Availability Factor (AF, %), Mean Time between Forced Outage (MTBFO), Mean down Time (MDT). O&M Contractor shall benchmark the same with the best in Industry and continuously try to improve.

Maintenance –

- Complying with the requirements of all equipment manufacturers' manuals in accomplishing all scheduled maintenance type of work, unless otherwise agreed to by the Parties. Aligning, lubricating, adjusting, and calibrating all equipment as required. Accomplishing or causing to be accomplished on-line and off-line unscheduled maintenance, in accordance with the Standing Instructions and Procedures. Keeping all calibration test and measuring equipment in good repair .Maintaining calibration of sensors, controllers, recorders, meters, transmitters, gauges, and protective relays, as required to maintain acceptable parameters.
- Reporting all significant known, operation, maintenance, design and equipment deficiencies to the owner. Performing periodic maintenance inspections to identify and report status of equipment and system deficiencies and initiate appropriate maintenance and repair.
- Performing (or cause to be performed) maintenance and repair of all equipment (excluding Scheduled Maintenance services); Performing (or cause to be performed) required maintenance for electrical systems, plumbing, ventilating and air-conditioning of the buildings.
- Organizing maintenance activities with a computerized maintenance management system preferably SAP provided by owner for work order generation, equipment history, bill of materials, inventory control, scheduled maintenance, scheduling, backlog, reporting, productivity analysis, calibration records and cost tracking. Adequate basic knowledge of operating SAP Maintenance modules shall be required.
- Maintaining an environmental, safety and health program .Conducting a quality control program. Procedures will include the use of logs and checklists documents, that the specified procedures, inspections, and tests have been satisfied. The procedures will encompass recommendations, procedures, tests and inspections recommended and/or specified by the manufacturers/vendors of the Power Plant equipment. The program will also include inspections to verify that procured material meets the applicable specifications. Records will be maintained of test and inspection reports.
- Handling and disposal of Waste, Hazardous Waste and Materials.
- Disposal Services and Site for the Plant waste, hazardous waste and materials shall be the O & M Contractor's responsibility within the battery limit.
- CPP of Refinery being complex and total shutdown can only be planned with Refinery shut down. Therefore all such defects to be identified time to time and should be liquidated during TA period as declared by Owner with in the stipulated time with additional resources with no implications to Owner.

2.2.2 O&M Contractor shall do Root cause analysis and shall develop FMEA Model for evaluating Equipment failure and devise action plan accordingly.

2.2.3 Cost and Expenditure – Compiling and Maintaining records of all costs, expenses made in connection with the operation and maintenance of the PLANT by O&M Contractor and Owner and submitting the detail expenditure reports and budget to the Owner Annually.

2.2.4 Managing Equipment identifications, Inventories/services, Consumables and Documents-

- Maintaining an equipment tagging and identification system, and managing the spare parts inventory of the Plant, Updating all Plant engineering drawings to reflect changes, modification or deletions to the Plant as they are made.
- Determine the requirements for consumables and other equipment and procure adequate stocks for the continuous operation and Scheduled Maintenance of the Plant. Consumables in the O&M Contractor scope is attached as schedule-8.
- O&M Contractor to do initiate necessary activities in terms of identification of OEM Equipment/AMC suppliers as defined in the contract in Owners scope .Develop scope , proposals, requisitions , follow ups for the services need to be tied up by owner as per contract . It will be the responsibility of O&M Contractor to ensure the services are tied up in time to meet the Plant O&M requirements. Owner responsibility shall be limited to placement of Purchase order /Contract agreement.
- Striving to meet, within the Plant's capabilities, certain requirements of the Owner that may be given from time to time as to the desired Refinery production schedule and other operating objectives.
- Maintaining Proper documentation system for retrieval of documents and appointing a document controller for properly managing the documents. Preparing and maintaining both manual and management information system generated operating and accounting logs, records and reports documenting the operation, maintenance and repair of the Plant, including hazardous operations reports and all other logs, records and reports required by Good Engineering and Operating Practices. Necessary office space shall be provided for developing documentation room.
- Allowing the Owner and its agents and representatives access, at all times, consistent with relevant safety procedures, to the Power Plant, all operations relating to the Services and any documents, materials and records and accounts relating to such operations for purposes of inspection and review, as well as granting such access to such other persons as the Owner shall reasonably request
- Maintaining up to date Operation and Maintenance Procedures and manuals. Setting up and maintaining plant chemistry control. Managing the O&M Contractor's work force in the course of operating and maintaining the Power Plant. Support to owner in Coordinating with the fuel supplier and the relevant utilities supplied from Refinery authorities in connection with the routine supply of utilities. Operations philosophy should be to optimize looking into operations as well as reliability. Normal operations shall have 2GT, 3 STG, 1 UB & 2 CFBC

to cater -1000-1200 TPH of steam & 145 MW of Power. Any changes in ops philosophy should be implemented post approval of Owner.

- Managing and maintaining any and all certificates, permits, licenses and inspections necessary for the continuous operation of the Power Plant and providing all reporting that is required by the Owner.
- O&M Contractor shall be responsible for the costs for their technician's tool boxes, all general tools required for regular O&M, including all spanners/tools. O&M Contractor must have at least basic level equipment/instruments for executing the normal O&M services. Further any other equipment/tools /instruments essential to carry out O&M of plant shall be arranged by O&M Contractor.

2.2.5 Planners/ Technical Assistance /Services –

- Evaluating the Power Plant operations and make recommendations to the Owner on cost-effective ways to improve the Power Plant and its operation.
- Identify the best configurations of CPP as per Refinery power and steam requirements for further support to operations.
- Conduct internal Energy Audits of the Plant and capacity test annually and submit the report to owner.
- Submitting promptly to the Owner from time to time any other material information concerning new or significant aspects of the operation of the Power Plant.
- Submission of all Reports /MIS/ Performance and Guarantee tests related to Plant as per agreed methodology /philosophy between Owner and O&M Contractor.

2.2.6 Interconnecting Substation and Grid Management - The O&M Contractor shall be responsible for operating and maintaining the Owner's switchyard and distribution facilities up to the take-off points of the customers as defined in the scope of work of Plant. O&M Contractor need to maintain log as required by PSEB and Government agencies and need to coordinate for outages /shutdowns. All Services like Hotline/offline washing, Transformer filtrations, routine inspections by Third party/PSEB etc. As required shall be carried out by O&M Contractor.

2.2.7 Records Retention

O&M Contractor shall retain and preserve all records, reports, documents and data created in connection with the operation and maintenance of the Facility till the expiry / termination of the contract, unless otherwise specifically agreed to, by the parties for a particular record. The same need to be properly handed

over to Owner after the contract period is completed or the contract is terminated.

2.2.8 Boarding, Lodging & Transportation

The O&M Contractor shall take care of the boarding, lodging, Labour colony and all travel arrangements for all its direct and indirect Employees engaged in Plant O & M services. O&M Contractor to ensure that the facilities extended/arranged to their employees and labours shall be the best and far above the basic living standards. In addition to this, O&M contractors arrange vehicles for its own employees working in power plant for internal movement inside the refinery. O&M Contractor shall also develop a state-of-the-art Guest House for the recreation of the employees with adequate facilities.

Quality Management System /MES – Owner may like to further develop systems to comply with international standards of Quality Management system (ISO-9001), PSM, Environment standard, OSHA and MES for the complete refinery. O&M Contractor shall extend the necessary support to comply with these standards for the Plant as per scope of the contract. O&M Contractor shall help in executing MES by owner.

2.3 Battery Limit

Battery limits of scope of CPP, CFBC & MHS shall be as per safety district document of CPP. All the equipment in the layout are to be operated and maintained by the O&M Operator. For 220 kV switchyard, battery limits of O&M Contractor start from 220 kV incoming PSEB line gantry of switchyard and all equipment in 220 kV switchyard plot plan shall be in its scope. For Substation - 10, battery limits of O&M Contractor start from all incoming cables to substations except outgoing cables from panels to respective units / equipment (Refinery Process Unit). Further refer Schedule-7 for scope Matrix.

- 2.4** O&M Contractor shall be responsible for arranging ladders / equipment / trolleys / cranes for rigging/transportation activities and other maintenance activities. For the jobs above 12 metric tonnes, HMEL shall provide/arrange the cranes.
- 2.5** All Electrical equipment standard diagnostic testing, relay testing/troubleshooting shall be in O&M contractor scope.
- 2.6** HMEL certified vendors to be selected while giving electrical testing activities subcontracting.
- 2.7** Periodic (yearly/Five early) 220KV yard equipment preventive maintenance shall be carried out by O&M contractor.
- 2.8** HVAC AMC (Including VAM, Window/Split/Tower AC, AHU) shall be in O&M contractor scope with dedicated team at the site.
- 2.9** Coordination with M/s PSPCL regarding 220kV transmission line maintenance and troubleshooting shall be in O&M contractor scope.
- 2.10** CPP & CFBC Elevator AMC shall be in owner's scope however O&M Contractor shall do the necessary co-ordination and planning for maintenance of elevator.
- 2.11** CPP & CFBC UPS AMC shall be owner's scope however O&M Contractor shall do the necessary co-ordination and planning for maintenance of UPS. Routine CM will be done by O&M contractor.
- 2.12** Renewal of licenses- Electrical Inspector (official fees in HMEL's scope)

- 2.13** Repair and fault identification of cables, cable jointing, Replacement of faulty cables shall be in O&M contractor scope. All 33kV outgoing cables till refinery substation shall be in O&M contractor scope. Spares shall be provided by owner
- 2.14** All equipment BOM update and PM plan to be reviewed and if required same to be updated in O&M scope. Budget preparation and submission to HMEL for review in November month of each financial year.
- 2.15** HMEL workshop would be elementary shop. Jobs not in capability of our elementary workshop has to be got executed by contractor from outside source. . O&M Contractor may use Owners workshop. As defined in RFQ calibrations need to be done by O&M Contractor, hence C&I instruments and calibration equipment shall be in O&M Contractor scope. Space shall be provided. Workshop Equipment scope is attached as Schedule 5.
- 2.16** There are equipment's like PH, ORP, Conductivity, TDS, spectrophotometer, hot oven, Hot Plate in local lab. All Lab Equipment shall be in Owners scope. O&M Contractor shall collect samples and give to lab for testing and collect the results. However Minor analysis at local lab with above equipment shall be done by O&M operator.

Office space shall be provided for Engineers & above. O&M operator may have their own arrangement/Porta Cabin/Containers for other manpower if required. (Technicians/Field operators /Maintenance staff /Helpers/Housekeeping /administrative staff etc)

3.0 OBLIGATIONS OF THE OWNER/EXCLUSION FROM THE SCOPE OF CONTRACTOR-

The Owner's obligations shall include the following:

- 1) Providing the O&M Contractor with an initial supply of commissioning spare parts and special tools as provided by EPC Contractor on a list to be made available by the EPC Contractor. All other tools/metering equipment shall be in the scope of O&M Contractor. OEM Guarantees /Warrantees as per contract which is normally for one year shall be shared with O&M Contractor. O&M Contractor shall coordinate for any OEM support required during the period of warrantee/guarantee.
- 2) Providing all other technical information in its possession that is necessary for the O&M Contractor to perform its duties, which any way the O&M Contractor shall be gathering during commissioning phase on behalf of Owner.
- 3) Security of the plant, landscaping and horticulture activities. However, O&M Contractor shall comply with all systems/procedures of the Owner.
- 4) Designating an Owner's Representative as Engineer In charge, who will have the power to bind the Owner in all matters relating to the O&M Contract, Approvals and Review.

- 5) Reviewing and Approving in a timely fashion, the Manpower selection , Vendors , Sub-Contractors , Budget, O&M Program , inspections and any other O&M Contractor's responsibility that requires the Owner's approval.
- 6) Spares, Lubricants and chemicals shall be in the scope of Owner. However all necessary support in identifying spares/lubricants/chemicals and raising timely indent , follow up with vendor considering lead time to ensure that the availability of spares/lubricant does not impacts the performance /availability of equipment /system shall be the responsibility of O&M Contractor. Further after receipt of spares and lubricants at site, issuing from main Refinery stores and stocking/storing in CPP stores and further handling shall be in the scope of O&M Contractor. O&M Contractor will also maintain a Sub-Store at CPP premises and manage inventories. All other consumables including PPE shall be in the scope of O&M Contractor. All material inspection at warehouse within 3 days of intimation in O&M scope.
- 7) Intercom and limited Walkie- talkie & limited FLP phone (15 Nos) shall be provided by Owner. However, any other Communication equipment/FLP phone requirements shall be in the scope of O&M Contractor.
- 8) The Owner shall be responsible for entering into contracts for furnishing and delivering of fuel to the Site at the Battery limit as defined in the contract. However O&M Contractor shall extend necessary support for organizing the same.
- 9) Delivering online Utilities and fuel at the battery limit of CPP shall be the responsibility of the Owner as mentioned/listed in the contract. However, O&M Contractor shall provide necessary coordination support.
- 10) CMMS system /SAP system shall be provided by the owner. O&M Contractor shall utilize the system for maintenance management and Environmental Health and Safety (EHS). Material management and procurement shall be done by the deputed personnel of O&M Contractor utilizing SAP. O&M Contractor shall maintain the system to the optimum standard. SAP upgrades, licence fees shall be in the scope of Owner.
- 11) All relevant correspondence related to statutory requirement /change in law/Acts/rules identified by O&M Contractor which can impact O&M of Plant where by owners intervention may be required. All standard /routine activities, coordination, liasioning and all compliance to statutory requirements shall be done by O&M Contractor. Statutory payments shall be in owner's scope.
- 12) Review and witness all guarantees related to performance of Plant/Environment and recommendation /decision about penalty applicable to O&M Contractor shall be decided by Owner Engineer In charge after reviewing reports submitted by joint committee of owner and O&M Contractor.
- 13) Owner shall be responsible for LTSA/OEM/AMC for specialized services agreed between O&M Contractor and Owner before finalization of contract. The O&M Contractor should clearly specify the list of specialized services as defined in

Schedule-3 of Appendix-A. All other services shall be completely in the scope of O&M Contractor. O&M Contractor shall perform all acts and duties required to manage such service providers seamlessly on behalf of owner to ensure performance under this agreement.

- 14) The Owner shall provide O&M Contractor limited to up to engineers with proper space for offices, storage and training. The facilities shall be provided as existing at site and as handed over by the EPC Contractor including office furniture.
- 15) Further, complete office set up including PC, Office automation equipment, Printers, scanners, Xerox M/c, storage racks, etc. shall be arranged by O&M Contractor.
- 16) Owner Facility Sharing- The mentioned facility shall be available for sharing to O&M Contractor i.e. OHC (Occupational health centre), Medical Centre, Canteen facility on chargeable basis, Security, Fire Tender, Laboratory, Workshop Equipment as available. And any other services apart from the agreed list shall be managed by O&M Contractor. House Keeping services shall be in the scope of O&M Contractor. However staffing plan should indicate strength of manpower for housekeeping.
- 17) Insurance as defined in General Conditions of Contract.
- 18) Compliances – Only Govt. fees to Obtain all permits, licenses and other approvals necessary to operate the Plant with the assistance of O&M Contractor (other than permits, licenses and approvals specific to the O&M Contractor) & its renewal thereof. All other expenditures shall be in the scope of O&M contractor.
- 19) Insurance: Provide suitable insurance policy to cover Machinery break downs and other exigencies like fire.
- 20) Waste Disposal - Arrange for the collection, transportation and disposal of waste arising from operation of the Plant at three points near the Plant boundary.
- 21) To arrange all fuels at the Battery limit. Evacuate Ash and solid waste after the terminal point .HMEL shall finalize an agency. However all coordination to be done by O&M Operator.
- 22) All other activities, items, equipment, services deemed essential for O&M of Plant in an efficient manner with adherence in all terms to statutory requirements, Government regulations and other standard and safety standard apart from the above listed activities shall be completely in the scope of O&M Contractor.

4.0 PROCEDURES AND REPORTING TO OWNER

- HMEL shall nominate an Engineer-in-charge with whom O&M Contractor can co-ordinate for all O&M matters pertaining to the Plant. Engineer In- Charge shall have the requisite authority to render binding directions, consents or approvals, and respond to accidents or emergencies relating to the Plant. Along

with O&M EIC, there shall be functional leads for routine coordination between functional departments.

- O&M Contractor shall develop systems /Plan /Schedule of O&M of Plant including preparing daily, weekly, Monthly and Annual reports and other MIS and the same to be approved by Owner's Engineer In charge before putting into operations. All relevant reports related to Plant shall be submitted by O&M Contractor to owner timely as defined by Owner as and when required. O&M Contractor responsibility with respect to plant performance, safety and Environment compliance is final and approval from Owner does not absolve from the responsibility. O&M Contractor to ensure the systems are developed /approved during the Mobilization phase so that the same can be immediately put into service in operation. Regular review shall be conducted by Owner with O&M Contractor on performance of O&M Contractor.
- O&M Contractor shall identify competent vendor for all purchases/services and shall take prior approval from Owner for procurement of any items/equipment/services under O&M Contractor scope.
- O&M Contractor shall ensure equal participation of Owners representative during recruitment of O&M staff and prior approval need to be taken from Owner Engineer In-charge before finalization of candidate. O&M Contractor need to submit resume of all the manpower to Engineer In charge of Owner.
- O&M Contractor have to follow Refinery Work Permit systems. Adequate training shall be carried out for the same. All the safety standards developed should comply with Refinery standards.
- O&M Contractor have to follow the nature of Refinery shift schedule and security aspects. However manpower deputation shall be as agreed in the contract. During the shift Operations, CPP shift In-charge shall be reporting to Refinery shift Superintendent and have to report for any kind of unsafe occurrence /incident /accident. O&M Contractor shall have admin/HR representative to coordinate for all security aspects.

5.0 MANPOWER DEPLOYMENT:

O&M of Plant

O&M Contractor shall immediately depute Plant manager and complete deployment process within 60 days for running plant in consultation of owner EIC. PM, DPM & HODS to be recruited/retained only after thorough review and interview by Owner. Owner EIC may postpone or pre-pone manpower deployment at site.

General Guidelines –

“Indicative manpower mentioned in Schedule-1 Organogram. However, Prior to bid submission, the Contractor shall undertake a mandatory visit to the Plant to inspect all facilities, review prevailing operating conditions and assess the actual requirements for executing the Operation and Maintenance services. The Contractor shall independently evaluate the scope of work, plant configuration, equipment condition, operational practices, statutory requirements, and overall resource needs. Based on this assessment, the Contractor shall propose the optimized manpower and submit its final quote accordingly. No claims, variations shall be entertained subsequently on account of inadequate assessment by the Contractor.

O&M Operator shall propose an organogram as per the understanding of the overall scope. Productivity should be paid due attention and focus should be to keep minimum manpower with high level of productivity.

O&M Contractor shall identify competent vendors for all purchases/services and shall take prior approval of vendors from Owner for procurement of any items/equipment/services under O&M Contractor scope.

Manpower competency & skill is the key to Reliable operation of this Plant. Overall the Manpower competency of the team shall also be reviewed by Owner and accordingly the Manpower need to be trained and can re-appear once. In case of inability to clear competency test, O&M operator shall replace the manpower within 3 months. Training shall be an important aspect. However O&M operator to develop an approach to identify skill Matrix, do gap analysis and conduct training with validation process. Detail procedure to be submitted to Owner for approval. Similarly internal promotions & Annual incentives shall have clear policies. O&M operator shall develop a clear procedure of development, assessment, validations and then promotion. The same need to be approved by the Owner. Owner's team shall be part of the Assessment Team for all above.

Manpower quality shall be paid due attention while recruitment as a small mistake in O&M can be catastrophic and can lead to unsafe conditions and heavy loss to Refinery. Human competency have been analysed as the main cause of 90% of failures. Hence best of the manpower to be deputed and continuously trained. All officers to be recruited only after formal consent of Owner EIC.

In order to attract best of the Talent from the Industry, Key positions identified by Owners shall have best of the remunerations and Owners approval to be taken by O&M Operator during the Placement process. O&M Operator shall ensure that any manpower transfer, leave or deputation to any other site should be done with formal consent of Owners.

Basic nature of Manpower Envisaged for the Contract but not limited to would be as mentioned below.

Plant Managers, Lead PSM & Reliability, Lead Operation Manager, Shift In-charge, Maintenance In-charges, Maintenance engineers & technician, Panel Operator, Field

Operator , Safety Officer , Chemists , Hot gang with IBR welders , Reliability engineers Admin/HR/Liaison officer, Technical services Engineer, Planning & Inspection Engineer , PSM Coordinator & OMC (Operation Maintenance coordinator). Senior management team and HODs clear responsibility Matrix with Annual KPI to be submitted within a month.

6.0 GUARANTEES, PENALTIES, ENVIRONMENT LIABILITIES

6.1.1 Emissions- Compliance

O&M Contractor shall ensure that Emissions are maintained as per Performance Guarantee Test Results or levels agreed between the parties. It shall be within Pollution Control Board norms, Clearances and shall be within the pollution control limits at all times. Repeat failure to comply shall be construed as non-performance.

6.1.2 Penalty due to Outage impacting Refinery Power, steam or Feedwater -

The contractor should ensure reliable operation and avoid forced outage for the Gas Turbines, Steam Turbine, and Boilers. Any outages/conditions leading to disturbance to Refinery Process due to disturbance in Power, steam supply or feed water to Refinery, the O&M Contractor will pay as penalty 20 Lacs per such outage. Should such an outage cause a Black-out Condition the penalty shall be 50 Lacs. Any subsequent black out or refinery disturbance shall be construed as non- performance.

In case of achieving Zero disturbance to Refinery, Annual Incentive of 10,00,000/- shall be applicable.

6.1.3 Penalty due to damage to HMEL Property or Fire (Minor /Major)/Non-compliance to scope

Any damage to HMEL Property like Walkie Talky, IS Phone, furniture, wallpapers, etc. shall call for penalty of maximum Rs.10, 000/- per item.

Any damage caused to HMEL property, including but not limited to walkie-talkies, IS phones, furniture, wallpapers, etc. Shall result in a penalty equivalent to the actual cost of repair or replacement of the damaged item(s). The cost will be determined based on the latest procurement or replacement value as per HMEL PO/standards.

6.1.4 - Penalty – Housekeeping

Housekeeping and upkeep of Plant equipment is important for safety and reliable operation. O&M operator to ensure that the equipment's are maintained as per their basic condition & the operating areas are free from obstacles /unwanted consumables/spares/tools.

Critical areas are Crusher, Boiler, JNTs, MHS, Silo, Turbine /Drive Turbines, GT Enclosures, Lube Oil skids, Fuel systems. All these should be free from dust & spillage and should be maintained well with systematic schedule. This includes removal of spilled coal and cleaning and sweeping of coal dust from all conveyors, conveyor galleries, crusher house, stacker re-claimer area, all JT's, bunker floor, building and equipment, duplex feeder, chutes, sump pump pits, minus level area of reclaiming

hoppers, de-watering of CHP, cleaning of coal from drainage system, head and tail pulleys of various conveyor belts, removal of chocking of coal from chutes, crushers, roller screens, stacker re-claimer .Similarly, all the equipment should be kept in cleaned condition all the time to facilitate easy inspection and good working condition. Similarly, Turbine /Drive Turbines, GT Enclosures, Lube Oil skids, Fuel systems shall be free from dust & spillage and should be maintained well with clear schedule. Mechanized equipment to be used for housekeeping.

Housekeeping performance shall be evaluated through a defined checklist and joint inspection Non-compliance leads to penalties of up to ₹50,000, and an incentive of ₹25,000 will be given to maintain 90% compliance.

INR 50,000 on monthly basis shall be penalized for non-compliance. The said deduction will be applicable on the basis of severity of Non-compliance. The decision of engineer in charge shall be final in this regard.

In case of Good Housekeeping similar Incentive of 25,000/- on Monthly basis - shall be applicable.

6.1.5 Penalty – Maintenance

- Violation of procedures like SOP, SMP and safety PPE's.
- Any critical equipment trip/damage or repetitive work due to poor workmanship, negligence or non-compliance with respect to PM & CM plan .
- Delay in Mobilization of resources
- Delay in closure of defects more than 15 days considering spares are available & negligence in PM , LLF
- Improper Notifications closure & improper update of history in SAP

Penalty clause should be in line with HMEL KPI:

- PM Compliance >99.5%
- Schedule work order compliance > 90%
- Unplanned jobs (urgent/emergency) < 7%
- CM Compliance: Supercritical equipment-100%. Critical and others >95%
- SMP/SOP submission to HMEL/ updation before due date 100%
- Compliance through ODR/LLF =100%
- Repeat jobs on equipment after overhauling due to poor workmanship-Zero.

In view of above Penalty amount of INR 50,000/ on monthly basis - shall be applicable on non - compliance of any of the above aspects.

In case of full compliance, similar Incentive of 25,000/- on monthly basis shall be applicable.

6.1.6 Disruption /Delay of Material Handling system (CFBC) :Penalty

Any disruption of coal, Petcoke Handling system and/or Lime handling system or Disruption in ash conveying & ash evacuation system for a period more than 8 hrs shall call for Penalty INR 500,000/- . Inability to identify the root cause & avoid repeated failure shall be considered as non- performance. In case of delay in unloading of wagons beyond permissible timing of 5 Hrs., Railway penalty have to be paid by O&M operator.

6.1.7 CFBC Availability - CFBC Boiler availability shall be maintained Min 345 days Annually. (Non-availability shall be primarily on account of Annual inspection, Maintenance and IBR).

6.1.7 Major Asset Availability-

Major asset like Gas turbine/Steam Turbines/Utility boilers/HRSG/ CFBC availability all the Time other than planned maintenance outages. Any forced outage of major asset shall call for penalty of 10 Lac/ asset per instance.

6.1.7 Manpower Availability:

O & M manpower shall be available at site as per organogram all the time. Any deviation shall be treated as noncompliance. Absentees Equivalent amount shall be deducted from monthly invoice @ Rs 50,000/- per day post 10 days continuous absence.

The Contractor shall mobilize all manpower and resources in accordance with the approved mobilization schedule and within the timelines specified in the Contract. Any delay in mobilization beyond the agreed date shall attract a penalty of INR 20,000 per day per un-mobilized position until full mobilization is completed. A delay exceeding fifteen (15) days shall be treated as a material breach of contract

6.2

The liquidated damage/Penalty vide clause no 6.1.2 and all Incentives shall be reviewed on Annual basis and accordingly settled. Balance clause for Penalty shall be settled monthly. The same shall be consolidated and submitted after getting duly approved by Owner after every month along with Invoice. In case of series of Penalty applicability simultaneously, highest one shall be only applicable. All the bonus/Incentive shall be cancelled in case of Black out /Refinery disturbance. In case of any dispute, HMEL EIC decision shall be final & to be complied.

In case of a new MOC or commissioning of the new Project, a stabilization period of 72 Hrs shall be applicable. However, due to commissioning, if main plant is affected. Penalty shall be applicable.

However, Incentive and Penalties shall start after 3 months of Commissioning of New Units. The maximum liquidated damaged to the O&M Contractor in the contract shall be limited to a maximum of **7.5 % (seven point five)** of Annual O&M Fees. Incentive

applicable shall be limited to a maximum of **7.5% of Annual O&M fees**. Deduction of Liquidated Damages shall in no way relieve the bidder from discharging obligation under this Contract.

O&M contractor to keep regular monthly records of the details for review by Owner. Penalty crossing beyond the cap shall imply O&M Contractor's default and non-performance of O&M Contractor and may lead to necessary action by owner as defined elsewhere in the contract.

SUMMARY TABLE OF PENALTY & BONUS -

Sr. No.	Nature of Penalty / Incentive	KPI	Implications/Benefits
1	Outage impacting Refinery Power, steam or Feedwater /Annual basis	Zero Outage impacting Refinery Power, steam or feedwater	Incentive: INR 10Lac
		Outage impacting Refinery Power, steam or feedwater	Penalty: 20 Lacs
		Blackout condition	Penalty: 50 Lacs
		Any subsequent blackout or refinery disturbance	Penalty: Non performance
2	Maintain steam and power generator available all time except planned outages	Zero Forced outage of steam or power generator	INR 10.0 Lacs/ Power steam generator forced outage
3	Availability of Manpower as per agreed Organogram	Maintain qualified manpower as per agreed Organogram	Deduction@ Rs 50,000/-per person per month for the unavailable manpower as per organogram post 10 days of continuous leave
			If the Manpower is not available for more than 2-month, deduction shall be INR 20,000 per day for each vacant position Any delay in mobilization beyond the agreed schedule shall attract a penalty of INR 20,000 per day per un-mobilized position until

			full mobilization is completed
4	Damage to HMEI Property or Fire (Minor /Major)/Non compliance to scope	Damage to HMEI Property	Penalty: Rs.10,000/- per item
5	Housekeeping	Good housekeeping	Incentive: INR 25,000/- monthly
		Non-compliance in housekeeping.	Penalty: INR 50,000/- monthly
6	Maintenance	Compliance and timely liquidation and good condition monitoring	Incentive: INR 25,000/- monthly
		Maintenance Penalty	Penalty: 50,000/-monthly
7	Disruption /Delay of Material Handling system (CFBC)	Disruption beyond 8 Hrs	Penalty :5 00,000
	Delay in unloading Rail wagon	Delay in Unloading beyond 5 Hrs	Penalty – Railway penalty

6.2.1 Incentive for Manpower Optimization

6.2.1 Manpower Deployment & Optimization:

During the first year of the Contract, the Contractor shall operate and maintain the Plant with the manpower strength quoted in its bid and contractually agreed under the Contract and no reduction, redeployment, rationalization or restructuring of manpower shall be undertaken without the prior written approval of the Engineer-in-Charge (EIC). Any shortfall, non-availability from the approved manpower deployment shall be treated as a breach of contract and shall attract penalties as specified under the Contract, without prejudice to HMEI's other rights and remedies.

During this period, the Contractor may review plant operations and manpower deployment to identify potential optimization opportunities through Automation solutions, modification, Digital tools, infrastructure development; however, no manpower changes shall be implemented without EIC approval.

After completion of the first year of operation, the Contractor may submit a detailed manpower optimization proposal for EIC's approval, including:

- I. Detailed technical justification
- II. Risk assessment
- III. Revised manpower deployment plan
- IV. Impact assessment on KPIs
- V. Expected benefits
- VI. Cost benefit

Optimization shall be executed after approval by the Engineer-in-Charge (EIC). Optimization

shall fully ensure :

- a. **No deterioration** in plant safety, operations, equipment health, maintenance & contractual KPIs
- b. **No disruption** to Plant's O&M performance
- c. Full continuity of the Contractor's responsibilities for O&M as defined in the Contract, without exception.

6.2.1.2

Subject to the prior written approval of the Engineer-in-Charge (EIC), HMEL shall bear the cost of approved optimization including infrastructure development or automation. However, the total cost of any such approved initiative shall, under no circumstances, exceed an amount equivalent to **two (2) times the annual cost savings** arising from the proposed and approved manpower reduction. Further, the payback period for each such investment shall not exceed **two (2) years** from the date of investment

6.2.1.3 Incentive for Manpower Optimization

The Contractor shall be eligible for incentives on meeting following :

- i) All contractual KPIs have been fully achieved for a continuous 12-month period after optimization
- ii) Optimization results are verified by the Owner
- iii) Optimization plan is mutually agreed
- iv) Approval is granted by the Engineer-in-Charge (EIC)
- v) No adverse impact on safety, performance, or compliance is observed

The incentive, computation methodology, and positions is defined in "Schedule–VIII Incentive Manpower Optimization" and payable only upon final written certification by the Owner. Vendor have to provide monthly cost against each position mentioned in the Schedule–VIII (Sheet no-2 name as Manpower Schedule rate).

6.2.1.4 Adjustment of Contract Value Upon Optimization

Upon successful implementation of any approved optimization and achievement of the corresponding savings, the Contract Value shall be reduced to the extent of the annual cost savings achieved as a result of such optimization. The revised Contract Value shall become effective from the date of certification of savings by the Engineer-in-Charge (EIC) and shall remain applicable for the balance duration of the Contract.

Upon approval and implementation of manpower optimization, reversion of manpower shall not be permitted under the Contract and no further claim or financial compensation shall be admissible.

6.2.1.5 Payment term for Incentive

Incentive shall be paid annually upon completion of the Contract Year, subject to certification by the Engineer-in-Charge (EIC). No advance or provisional incentive

payments shall be permitted.

The Incentive shall be payable solely for the year in which manpower reduction is achieved and duly verified, and shall not be applicable retrospectively or carried forward to any preceding or subsequent Contract Years.

7.0 PAYMENT MODALITIES

7.1 Payment for O&M Services

1. Invoices for each calendar month shall be submitted by 5th working day of every (ensuing) month.
2. The payment shall be made on 45 days from date of submission of Invoices (correct and complete in all respects).
3. O&M Charges shall be paid monthly after duly verified by Engineer In charge of Owner. Monthly payment for subsequent years will be escalated as per contract.
4. Escalation shall be paid as per the following formula:
 - The awarded rates, which is charged per month, shall remain in effect for 1 Year from the commercial operation/Commissioning date
 - On completion of first year of operations, for second and subsequent years, the monthly rate shall be escalated using the formulae given herein.
 - The derived rate after including escalation shall be effective for the complete year
 - The weightage of WPI in the index should be 10% : 0.1: (there shall be little supplies involved)
 - Accordingly the weightage of CPI shall stand at 90% :0.9:
 - WPI stands for **Wholesale Price Index for all commodities** and indexed to as published by Office of Economic Advisor GOI, and available on the net.
 - CPI stands for **All-India Average Consumer Price Index Numbers for Industrial Workers** and indexed to as published by Labour Bureau GOI and available on the net.

$$EF_n = (0.1X(WPI_n - WPI_{n-1}) + 0.9 X(CPI_n - CPI_{n-1})) / (0.1XWPI_{n-1} + 0.9X CPI_{n-1})$$

Escalation shall be as per the above calculation & maximum escalation shall be limited to 10%.

EF_n is the escalation factor

n is index of contract year, $n-1$ is index of previous contract year

WPI_n and CPI_n are the respective indices of contract year at Effective Date

WPI_{n-1} and CPI_{n-1} are the respective indices of previous contract year at Effective Date

(That's required for future manpower requirements in case of new Capex /MOC by HMEL /Augmentation) All Annexures are part of the Bid and all schedules need to be submitted by the Bidder along with the Bid.

7.2 Payment for Additional Services

Additional Services shall be provided to such extent and at such additional compensation as may be mutually agreed upon by and between the Parties. Additional manpower deployment by O&M Contractor, if required by Owner and/or as agreed between the parties for proper O&M of the plant in future, shall be paid as per the man hr rates provided for in the contract during the currency of the contract. Escalation shall apply for consideration of rate in next years as per the escalation formula defined in point no. 7.1 of Clause.

All Annexures are part of the Bid and all schedules need to be submitted by the Bidder along with the Bid

8.0 TERM OF THE CONTRACT

The term of the contract shall be 5 yrs with the option of an extension for another 2 yrs based on the performance of O&M Contracts. In the case of O&M operator unable to perform, the Owner has all the right to terminate the contract as per the terms and conditions mentioned elsewhere.

If the Owner elects to extend the Contract for an additional two (2) years the monthly price applicable in the fifth (5th) year of the Contract shall be considered as the base price for the extended period.

9.0 Bid submission

Bidder to submit in 2 Phase.

1st Phase – PQ Bid requirements to be submitted within 10 days

2nd Phase – Complete Bid can be submitted in 30 days time

All schedules & documents are required to be submitted by the bidder with sign & stamp

SCHEDULE-1

ORGANOGRAM AND STAFFING PLAN

1. Detailed Organogram

To be submitted by the Bidder

Organogram changes if required during execution of contract or inability to handle operation & Maintenance due to manpower constrain shall be sole responsibility of O&M contractor. Hence Organogram submitted shall be considered as minimum organogram & additional manpower if required at any stage may be mobilized over and above the specified one depending on complexity without any cost implication to owner.

SCHEDULE-2

DETAILS OF MOBILIZATION PLAN

To be submitted by the Bidder

The Mob Plan shall be submitted by the Bidders & accordingly complete manpower should be mobilized on or before 30.06.2026.

SCHEDULE-3

PRICE BID – FEES PAYABLE TO O&M CONTRACTOR & ADDITIONAL SERVICES

During the Term of this Agreement, the Owner shall, pay to the O&M contractor, for the proper performance of the O&M Contractor's Services under this Agreement, as per the fee break-up provided.

SCHEDULE-4 Deviation to scope

Complete scope and services have understood and there are no deviations /clarifications
To be submitted by the bidder

SCHEDULE -5

Approach paper to O&M to be submitted by the bidder

SCHEDULE -6

Present Organization Matrix and escalation Matrix to be submitted

SCHEDULE -7 PQ Bid criteria

To be submitted by bidder

SCHEDULE -8 Incentive Manpower Optimization

Bidder to submit Manpower schedule rate in Monthly cost column.