

**Request for Proposal  
for**

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**Selection of Project Management Consultant (PMC) for Turnaround  
of GMDC's 2X125 MW Akrimota Thermal Power Station, Gujarat**

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**Answer to Pre-Bid Queries and Corrigendum – I**



**Gujarat Mineral Development Corporation Limited  
Khanij Bhavan, 132-Ring Road, Gujarat University Ground,  
Vastrapur, Ahmedabad- 380052**

**Pre-Bid Meeting Date: 11<sup>th</sup> May-2023**

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## Part A: Responses to pre-bid queries

Sr. No.	Clause No	Description of clause	Pre-bid query/clarification	Response/ Addendum/ Corrigendum (if any)
1.	-	Context of RFP	We understand that Pre Engineering for all the 4 packages has been already carried out by GMDC and No, engineering document preparation (Pre Engineering) is in PMC's scope and orders have been placed/are likely to be placed. Please confirm our understanding is correct.	As per RfP.
2.	2.2 of Part 2	Duration of contract	Duration of 12 months indicated is on the lower side for the scope and volume of work involved ( 4 Mega packages). The time duration for completion should be a minimum of 24 months for completion of the planned works being a R&M project based on our experience	As per RfP.
3.	2.2 of Part 2	Duration of contract	Request to consider escalation of 10 % per annum for the balance (unclaimed/unfinished) component of the Fixed PMC charge at end of the contract period in addition to Extension of Time (EOT)	As per RfP.
4.	3.1 of Part 2	Services during Pre-Award phase	Request GMDC to provide a copy of the Detailed Project report (DPR) and assessment report for the overhaul of Akrimota Power plant. This is essential to assess the extent of engineering information and data available for the four (4) Mega packages envisaged.	Brief technical details from the Detailed Project Report (DPR) is being shared with the bidders as Annexure A in this document for reference.
5.	3.3, sub-clause vi, of Part 2	Statutory Compliance and requirements	Request GMDC to provide schedule of audits and inspections planned/scheduled during the Overhaul Execution phase for preparation of Overhaul Execution plan. Also, this facilitation with external stakeholders may please be carried out by GMDC	As per RfP.
6.	3.3, sub-	Performance	All liabilities and warranties and guarantees for meeting	The Bidder shall supervise the planning, scheduling, and

Sr. No.	Clause No	Description of clause	Pre-bid query/clarification	Response/ Addendum/ Corrigendum (if any)
	clause viii, of Part 2	Guarantee Test Runs and commissioning	the Performance Guarantees shall be to the account of the respective Package contractors and shall not be attributed to PMC	execution of Performance Guarantee Tests, and take active follow-ups from the vendors, to ensure timely completion of the Performance Guarantee Tests as per the Overhaul Execution Plan
7.	10.9 of Part 2	Completion of Work	Request to please indicate the list of documents/records/proofs that need to be provided by PMC for issuance of Completion certificate	The Successful Bidder shall be responsible for submitting all the documents mentioned in Section 5.1 of Part 2 (Deliverables) of the RfP.
8.	5.1 of Part 3	Pre-qualification criteria	Request to please consider for the <b>last 10 years (FY 2013 to FY 2023)</b> considering the long project completion durations of EPC and PMC projects for coal/lignite based thermal power plants in India.	As per RfP.
9.	-	-	Is there any possibility of Site visit by Bidders to have a better assessment of work content and understand requirements before submitting the Tender	<p>The Bidders are invited to visit the Plant and understand the equipment installed and their working conditions, prior to submission of the Bids. The objective of the Plant visits shall be to understand the scope of work, feasibility of execution, and make the Bidders fully conversant with the job, site conditions, constraints, and collect all information as required and as available before quoting against this specification.</p> <p>The visits are optional, the Bidders can opt to visit the Plant at their own discretion. Should they opt to visit the Plant, the Bidder shall submit a Plant visit plan to the Owner indicating the timelines and the key personnel visiting, for prior consent and approval. The Owner shall facilitate the visits for the Bidders</p>

Sr. No.	Clause No	Description of clause	Pre-bid query/clarification	Response/ Addendum/ Corrigendum (if any)
				and make necessary arrangements at the Plant. The cost of the Plant visit, including transportation and accommodation, shall be borne by bidder.
10.	-	Personnel and representatives	We request GMDC to allow submission of Experts who are empaneled with us, though they may not be on the payroll of the company	As per RfP.
11.	Clause 9.2 Risk Purchase Clause, of Part 2	Non - fulfilment of terms and conditions and Termination of Contract	We request GMDC to waive off this clause as this open ended.	Refer to the response submitted for the query listed in Sr. No. 23 of this document
12.	-	Context of RFP	Request GMDC to provide the brief scope of work under mega packages of 1) Boiler and ESP units, 2) Turbine and electrical systems, 3) DCS and instrumentation and 4) Balance of plant. This will be helpful to understand the breadth and depth of each package's activities being involved.	Brief technical details from the Detailed Project Report (DPR) is being shared with the bidders as Annexure A in this document for reference.
13.	3	Responsibilities of the bidder	Procurement of work / services / spares / equipment with right quantity, right quality and within right time - we understand that monitoring of such activities is under bidder scope as engineering, manufacturing / procurement, transportation, storage, erection and commissioning is under the scope of the respective mega package contractor, please confirm	While the respective Vendors will procure the work / services / spares, the responsibility of the Successful Bidder shall be to create "Procurement Plan" and "Overhaul Execution Plan" in collaboration with the package Vendors, monitor progress against the plan, and resolve any issues / conflicts raised by the Vendors to ensure timely completion of the Overhaul.
14.	3.1	Services during Pre-Award phase	For reviewing the technical specification, base document is required. Whether GMDC will provide any detailed project report (DPR) for overhaul work planned in order to review the specification, scope of Vendor. Whether GMDC is preparing the technical specification. Request GMDC to clarify the basis of technical specification preparation.	Brief technical details from the Detailed Project Report (DPR) is being shared with the bidders as Annexure A in this document for reference.

Sr. No.	Clause No	Description of clause	Pre-bid query/clarification	Response/ Addendum/ Corrigendum (if any)
15.	3.1	Services during Pre-Award phase	The Bidder shall also identify any obsolete and / or outdated items in the Vendors - whether condition assessment or residual life assessment of boiler / turbine / balance of plant is under the scope of the bidder. Otherwise, how the bidder will arrive at the conclusion (without any study) that the item / equipment is obsolete, request GMDC to clarify	<p>The Successful Bidder shall identify any obsolete or outdated items based on their previous experiences and technical capabilities. GMDC will provide available reports (RLA, condition assessment etc.) for any assessment done at the Plant as per Successful Bidder's request. The Successful Bidder may engage in discussions with GMDC to discuss the obsolescence of any items as well.</p> <p>The Bidder shall submit detailed justification note for alternative solutions, considering the interchangeability, reliability, safety, and ensuring that the alternative solutions are matching the OEM (Original Equipment Manufacturer) / OES (Original Equipment Supplier) specification, along with acceptance parameter needed to be achieved to adopt the alternative solutions.</p>
16.	3.1	Services during Pre-Award phase	The respective contractor will prepare the overhaul execution plan for his package, bidder will review the contractor execution plan and integrate all the contractor plan. Request GMDC to confirm.	The Successful Bidder shall be responsible to integrate the overhaul execution plans submitted by all the Vendors, focusing on sequencing of activities and identification of interdependencies to avoid any conflicts, and to ensure feasibility of overhaul execution.
17.	3.2	Services during Overhaul preparation phase	Whether any review engineering of contractor's drawing / document is under Bidder's scope of work? Request GMDC to clarify.	The Successful Bidder shall review all the technical and design specifications / drawings / other documents created by the Vendors, to ensure they're in line with the OEM / OES acceptance parameters, and submit the review documents to the Owner for approval
18.	3.2	Services during Overhaul preparation phase	The respective contractor will provide the BOQ, bidder will consolidate the BOQ from all the package Vendors	The Successful Bidder shall review the BOQ and provide necessary inputs for additions / deletions, as applicable as per the OEM / OES acceptance parameters. The Successful Bidder shall submit the consolidated BOQ to the Owner for approval
19.	3.3, sub-clause vi, of Part 2	Services during Overhaul execution phase	Statutory compliance will under the scope of respective bidder, however technical support will be provided by the bidder, request GMDC to accept.	The Successful Bidder shall monitor and ensure compliance of all the Vendors towards statutory requirements during the execution of the Overhaul. Further, the Successful Bidder shall highlight potential risks to GMDC and identify mitigations, as needed

Sr. No.	Clause No	Description of clause	Pre-bid query/clarification	Response/ Addendum/ Corrigendum (if any)
20.	3.3, sub-clause vii, of Part 2	Services during Overhaul execution phase	Whether inspection at manufacturer's place is under the scope of the bidder, request GMDC to clarify	As per sub clause iii under "Inspection" section of section i. of clause 3.2 of Part 2 of the RfP.
21.	4.1, sub-clause ii, of Part 2	Responsibilities of the owner	Request GMDC to clarify on whether expenses towards travel for attending meeting at Ahmedabad or at site will be reimburses by the bidder.	All the travel expenses shall be borne by the Successful Bidder
22.	1.6 of Part 3	Schedule of Bidding	Request GMDC to allow the submission of technical bid (and price bid) by online only. RFP fee, EMD will be furnished in physical form. Request GMDC to accept.	As per RfP.
23.	5.1 of Part 3	Pre-qualification criteria	We understand that similar work means PMC in Engineering, Procurement and Construction (EPC) of a coal or lignite based thermal power plant, or PMC in EPC of coal or lignite based large boilers/turbines, or PMC in Overhauling of a coal or lignite based thermal power plant, or PMC in Overhauling of large boilers/turbines	Similar works shall mean PMC in Engineering, Procurement and Construction (EPC) of a coal or lignite based thermal power plant, or PMC in EPC of coal or lignite based large boilers / turbines, or PMC in Overhauling of a coal or lignite based thermal power plant, or PMC in Overhauling of coal or lignite based large boilers / turbines.
24.	5.2.1 of Part 3	Technical Bid	Request GMDC to modify the clause as per the following: Number of PMC projects completed in India / Abroad with a contract value of PMC job greater than INR 4 crores	As per RfP.
25.	-	-	GMDC request to inform the estimated price of this PMC tender	As per RfP.
26.	5.3 of Part 2	Incentive for timely delivery of the project	<b><u>We request GMDC to modify this clause which is as under:-</u></b>  The Bidder shall be awarded with an amount equivalent to 5% of the Fixed PMC Charge defined in Section 7.1 of Part 2 of this document, as an incentive for timely delivery of the project, if the Bidder is able to successfully complete the approved Final Overhaul Execution Plan with the necessary quality standards, within the approved Final Overhaul Execution Plan schedule. In case the output delivered by the Bidder is	As per RfP.

Sr. No.	Clause No	Description of clause	Pre-bid query/clarification	Response/ Addendum/ Corrigendum (if any)
			not acceptable to the Owner, the Bidder shall not be awarded with this incentive, despite timely completion of the Final Overhaul Execution Plan. If the project is not completed as per the approved Final Overhaul Execution Plan schedule for any reason <b>Solely attributable to the Bidder</b> , the Bidder shall not be awarded with this incentive.	
27.	8, sub-clause v, of Part 2	Insurance	Please note, this is a PMC Contract, hence, Bidder shall not be liable for any break down or accident during the course of operation. Therefore, please delete this clause. Bidder shall take the insurance policies as per clause 8 (i),(ii)(iii) & (iv).	As per RfP.
28.	9.2 of Part 2	Non - fulfilment of terms and conditions and Termination of Contract	<p><b><u>We request GMDC to modify this clause which is as under: -</u></b></p> <p>If the Bidder fails to carry out the work as per terms and conditions of the contract to the <b>reasonable</b> satisfaction of the Owner, the Owner shall be entitled to forfeit the Performance Security paid by the Bidder as per Section 7.3 of Part 3 of this document. This, however, shall not absolve the Bidder from its obligation to fulfill the contract. In such event, the Owner shall have a right to complete and / or to get the work completed at the cost &amp; risk of the Bidder and the Bidder shall be responsible to pay such cost incurred by the Owner to complete the work and / or to get the work completed.</p>	As per RfP.
29.	9.3 of Part 2	Non - fulfilment of terms and conditions and Termination of Contract	<p><b><u>We request GMDC to modify this clause which is as under:-</u></b></p> <p>Likewise, if the Bidder does not fulfill the terms and conditions of the Contract and does not carry out the work up to the <del>entire</del> <b>reasonably</b> satisfaction of the Owner, the Owner has the right to forthwith terminate the Contract at its sole discretion, without assigning any reason, Under such events, the Owner shall be entitled to forfeit the Performance Security paid by the Bidder as</p>	As per RfP.

Sr. No.	Clause No	Description of clause	Pre-bid query/clarification	Response/ Addendum/ Corrigendum (if any)
			per Section 7.3 of Part 3 of this document, and the Owner shall have a right to complete the work and / or to get the work completed at the risk and cost of the Bidder	
30.	9.4 of Part 2	Non - fulfilment of terms and conditions and Termination of Contract	<p><b><u>We request GMDC to modify this clause which is as under: -</u></b></p> <p>For any reasons, if it is required, the Owner reserves rights to cancel, terminate, amend and / or alter the Contract and / or bifurcate and / or reduce the Contract work at any time <del>without</del> by <b><u>giving 90 days</u></b> any notice or reason to the Contractor and without incurring any responsibility.</p>	As per RfP.
31.	10.6 of Part 2	Arbitration	<p><b><u>We request GMDC to modify this clause which is as under:-</u></b></p> <p>All questions, disputes, differences whatsoever which may at any time arises between the parties to this RFP and subsequent contract in connection with the RFP and subsequent contract or any matter arising out of or in relation thereto, shall be referred to Sole Arbitrator <b><u>mutually appointed by both the parties</u></b> as per the provisions of Arbitration and Conciliation Act, 1996 and subsequent amendment thereto and the venue of arbitration proceedings shall be at Ahmedabad only. The Language of the Arbitration shall be in English only.</p>	As per RfP.
32.	10.13 (New Clause)	Limitation of Liability (New Clause)	<p>We request GMDC to add Limitation of liability clause which is as per earlier tender Reference no GMDC/ ATPS/ O&amp;M/ 01/ 2018-19 for Selection of a Contractor for Complete Operation and Maintenance of 2 X 125 MW Lignite Based Akrimota Thermal Power Station (ATPS) at NaniChher, Dist. Kutch, Gujarat for a period of 10 years , which is as under:-</p> <p>Notwithstanding any other provisions, except in cases of</p>	<p><u>New Clause</u></p> <p><b><u>Limitation of Liability</u></b></p> <p>Notwithstanding any other provisions, except in cases of criminal negligence or willful misconduct,</p> <p>1. Whether express or implied, in no event, whether as a result of breach of contract, warranty, indemnity, tort (including</p>

Sr. No.	Clause No	Description of clause	Pre-bid query/clarification	Response/ Addendum/ Corrigendum (if any)
			<p>criminal negligence or willful misconduct,</p> <p>a. Whether express or implied, in no event, whether as a result of breach of contract, warranty, indemnity, tort (including negligence) strict liability or otherwise, shall either Party be liable to the other for loss of contract, loss of profit or revenue, loss of use, loss of data or information, loss of power, cost of replacement power, increased cost of operation and cost of capital or for any indirect, special, collateral or consequential damages.</p> <p>b. the aggregate liability of the Contractor to the GMDC, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to any obligation of the Contractor to indemnify the GMDC with respect to patent infringement.</p>	<p>negligence) strict liability or otherwise, shall either Party be liable to the other for loss of contract, loss of profit or revenue, loss of use, loss of data or information, loss of power, cost of replacement power, increased cost of operation and cost of capital or for any indirect, special, collateral or consequential damages.</p> <p>2. The aggregate liability of the Contractor to the GMDC, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Value, provided that this limitation shall not apply to any obligation of the Contractor to indemnify the GMDC with respect to patent infringement.</p>
33.	-	-	Is there any provision for consortium?	As per RfP.

## Annexure A: Brief description of the project

GMDC has been operating a 2X125 MW lignite-based thermal power Plant (Akrimota Thermal Power Station, ATPS) over the past 15 years. ATPS has two units of 125 MW each, commercial operations for which started in May 2006, and March 2007 respectively.

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

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

GMDC is planning to execute a complete turnaround of its 2X125 MW Akrimota Thermal Power Station (ATPS) asset, with a focus on enhancing availability of both units to operate at full load and enhancing the reliability and efficiency of the asset. The overhaul of both units of ATPS is planned to be executed through mega packages to ensure smooth execution. The identified mega packages, are detailed below –

### 1. Boiler and ESP units

ATPS has circulating fluidized bed combustion (CFBC) boilers in both units, supplied by Alstom (later acquired by GE) at the time of commissioning. CBFCs are suitable for lignite-based operations, with inbuilt technology to maximize efficiency and handle sulfur emissions.

<b>Make</b>	Alstom Energy Systems GmbH (later acquired by GE)
<b>Type of Boiler</b>	CFBC boiler -405 TPH
<b>Reg. No.</b>	GT-4878 and GT- 5040
<b>Pressure</b>	159 bar
<b>Temperature</b>	538°C

<b>Heating surface area</b>	23044 m2
<b>Pressure component</b>	SH1, SH2,SH3,SH4,SH5, RH1,RH2, Economizer, Water wall .tubes and header
<b>Furnace size in Mtr</b>	12.9x8.0mtr
<b>1st Pass</b>	Water wall, SH4(23.5 mtr from 0 mtr), RH2(28.5 mtr from 0 Mtr)
<b>2nd Pass</b>	SH1,SH2,SH3,SH5,RH1,Economiser
<b>Drum Details</b>	MOC- BS-EN-10028-2-1993 Gr. NC 271,Dia-1372mm,Thickness-68 mm

However, due to lack of required spares and maintenance activities, deviations in overhauling of boilers vis-à-vis OEM guidelines (one boiler overhaul in the last 3 years compared to OEM requirement of annual overhauls), systems have been operating at sub-optimal levels affecting the efficiency and reliability of the asset.

Key systems associated with the boiler that require major overhauling include –

<b>System Name</b>	<b>Key Action Required (Non-exhaustive)</b>
Electrostatic Precipitator (ESP)	Complete replacement / retrofitting of the ESP with an objective to meet the latest environmental norms declared by the Ministry of Environment, Forest, and Climate Change
Tubular Air Pre-Heater (TAPH)	<ul style="list-style-type: none"> <li>- Replacement of blocked / dummy tubes across all blocks of the TAPH in both units</li> <li>- Overhauling of bellows, mother platers, and soot blower</li> </ul>
Cyclone	<ul style="list-style-type: none"> <li>- Refurbishment of cyclones (both units)</li> <li>- Installation of insulation bricks and application of refractory material</li> <li>- Fabrication and erection of vortex assembly</li> </ul>
Furnace, Superheater,	<ul style="list-style-type: none"> <li>- Overhauling of damaged and dummied furnace nozzles, tubes in RTZ area, soot blower and lance</li> <li>- Critical spare tubes procurement of water wall, Superheater, Reheater, Low</li> </ul>

System Name	Key Action Required (Non-exhaustive)
Reheater	temperature superheater, economizer, evaporator tubes and valves
Air and Flue Gas Circuit	<ul style="list-style-type: none"> <li>- Repair of impeller shaft, dampers, bearings, fluid couplings of fans</li> <li>- Spares procurement for fans, bearings, and couplings</li> </ul>
Feeding and Ash Collection System	<ul style="list-style-type: none"> <li>- Overhauling of belts, gearbox, and bunker gate of gravimetric feeder</li> <li>- Overhauling of chain link assembly and gearbox for lignite draglink</li> <li>- Overhauling of lignite rotary air lock feeder</li> <li>- Installation of ash draglink conveyor</li> </ul>
Pumps and Valves	Repair / Overhaul of equipment

The detailed process flow diagram including the key sub-systems associated with the boiler has been illustrated below:

**Process Flow Diagram:**

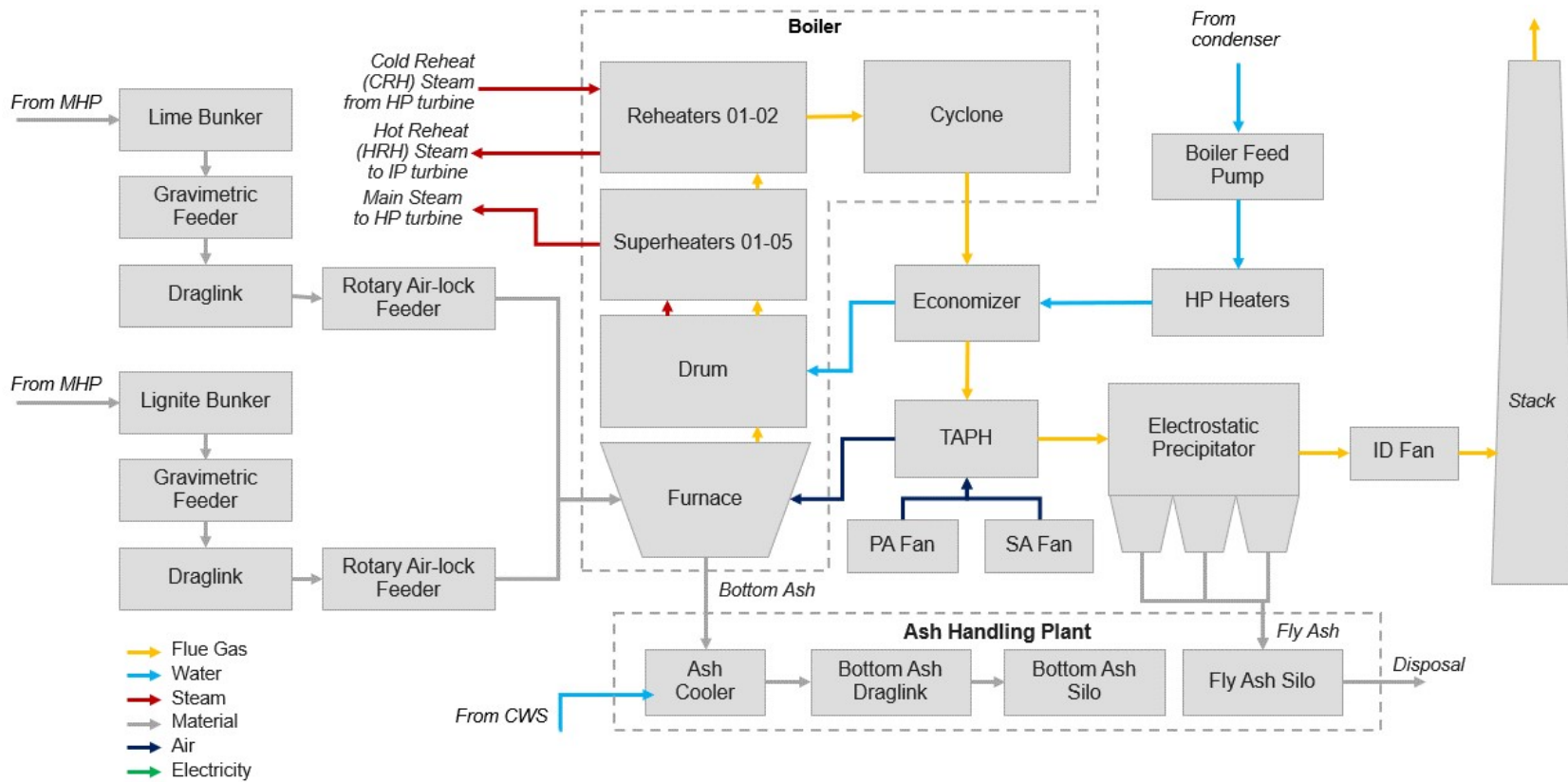


Figure 1: Boiler Process Flow Diagram

## 2. Turbine and Electrical Systems

ATPS has electro-hydraulic steam turbines (125 MW, 3000 rpm) in both units, supplied by Ansaldo at the time of commissioning. The turbines are designed for a useful life of over 30 years, subject to proper operations and maintenance.

However, ATPS has only undertaken a minor overhaul of the turbines since commissioning and has been operating for over 100,000 hours vis-à-vis OEM guidelines of overhaul requirement after 50,000 hours. Therefore, the turbines and the auxiliaries have been operating at sub-optimal levels affecting efficiency of the asset.

Key systems associated with the turbine and electrical systems that require major overhauling include –

System Name	Key Action Required
Main turbine and generator	Capital Overhaul of turbine generator with OEM supervision
Generator transformer	<ul style="list-style-type: none"><li>- Repair and rewinding of GT#2 transformer and bushing</li><li>- Overhauling of Winding Temperature Indicator and Oil Temperature Indicator meters of transformers, cooling fans, transducer, and control panels</li></ul>
Switchyard	Inspection and overhauling of coils, panels, compressors, isolators etc.
Cables	Replacement / Revival of equipment

The detailed process flow diagram including the key sub-systems associated with the turbine has been illustrated below:

## Process Flow Diagram

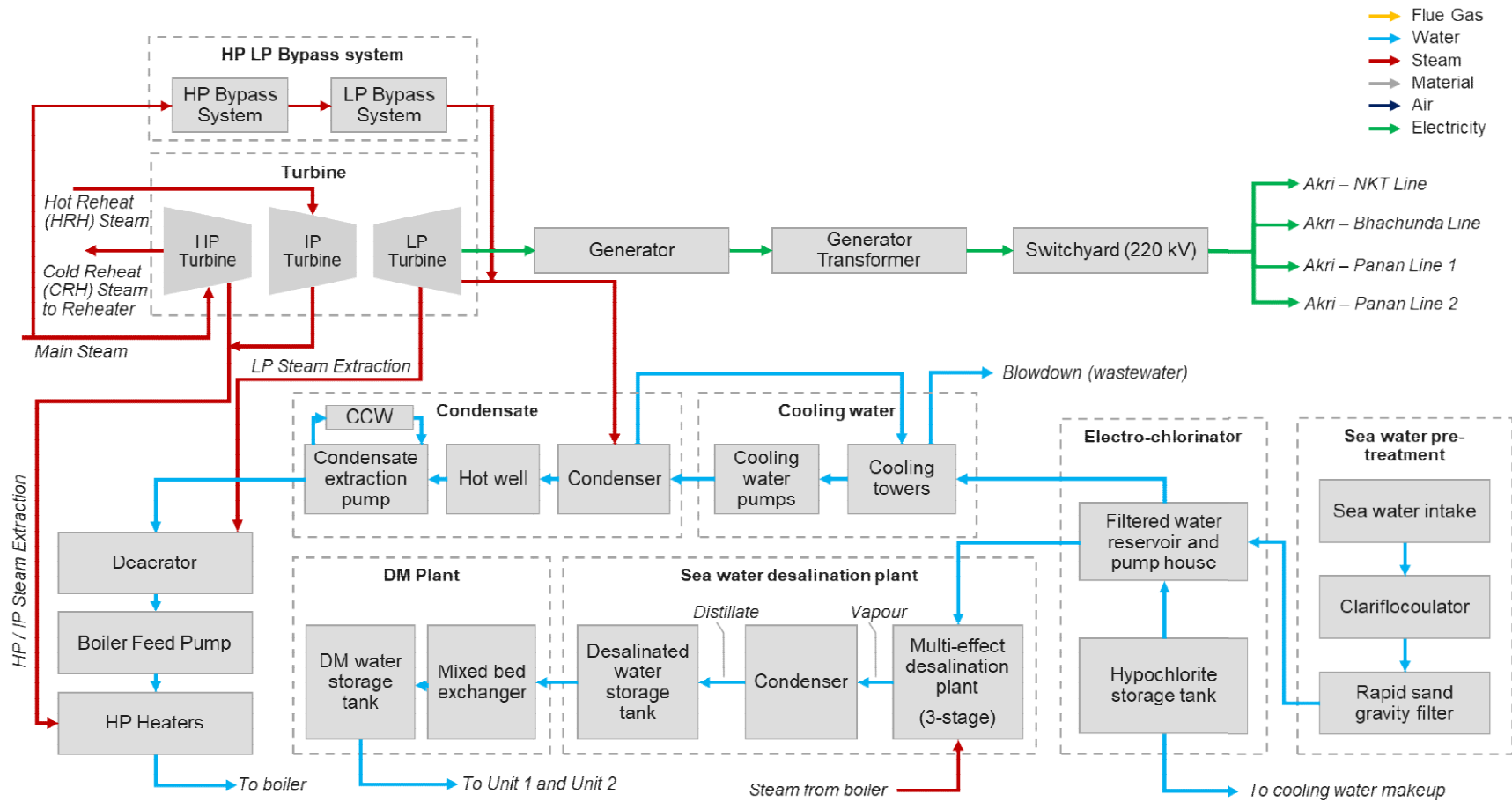


Figure 2: Turbine Process Flow Diagram

### 3. DCS and Instrumentation

ATPS C&I systems have been supplied by ABB, with certain minor systems supplied by Honeywell, Allen Bradley etc. C&I systems have not been upgraded since commissioning in 2006-2007. Major systems (like DCS) and their spare parts are obsolete. Further, OEM support has ceased for certain systems, leading to issues with repairing / replacement of the systems. Therefore, C&I systems across the Plant require replacement / revival to ensure sustainable operations.

Key systems associated with the DCS and Instrumentation that require major overhauling include –

System Name	Key Action Required
DCS	<ul style="list-style-type: none"><li>- Upgradation of the Human Machine Interface system</li><li>- Replacement of all the obsolete cards</li><li>- Installation of communication hardware and software from remote PLC systems to the central control room to enable central monitoring / control of plant sub-systems</li></ul>
Sensors	<ul style="list-style-type: none"><li>- Replacement of all the corroded junction boxes</li><li>- Installation of select field sensors for monitoring purposes</li></ul>

### 4. Balance of Plant

The Balance of Plant (BOP) mega package includes all the systems under material handling, supporting functions, and other BOP related equipment

ATPS procures lignite GMDC's mines (Mata na Madh and Umarsar) and is transported directly from the mines to the Plant via road. There is a designated yard for storage of lignite received from the mines, and currently, all ash generated by the Plant is being transported to Panandhro mine.

Complete material handling system has been installed by M/s TRF, with key systems such as Lignite primary and secondary sizers supplied by Mining Machinery Developments Ltd.

However, ATPS has not undertaken comprehensive maintenance of the critical material handling and other balance of Plant equipment across the Plant, affecting the overall performance of the Plant.

Key systems associated with balance of Plant include –

System Name	Key Action Required
Material Handling Plant	<p>Lignite handling plant –</p> <ul style="list-style-type: none"><li>- Inspection and overhauling of sizers, pump assembly, bearing, oil seals, apron feeder, impactor beater heads and arms, flat belt, drive pulley, rotor bearing etc.</li></ul>

System Name	Key Action Required
	<p>Ash handling plant –</p> <ul style="list-style-type: none"> <li>- Inspection and overhauling air compressors, air coolers, oil coolers, NRV valves, chain valve assembly, valves, and ash discharge pipes of different dimensions across the ESP</li> </ul>
	<p>Lime handling plant –</p> <ul style="list-style-type: none"> <li>- Procurement, installation and commissioning of lime apron feeder, lube pump assembly, and conveyor belts</li> </ul>
Cooling tower	<ul style="list-style-type: none"> <li>- Overhauling of gearbox, FRP blades, drive shafts of CT fans, spray nozzles, and CT fan motors</li> </ul>
Sea water treatment Plant	<ul style="list-style-type: none"> <li>- Procurement and installation of acid storage tank, alkali storage tank, acid and alkali measuring tank, and desal storage tank</li> <li>- Procurement and replacement of corroded pipes, valves and elbows in the MED</li> </ul>
Civil works	<ul style="list-style-type: none"> <li>- Overhauling of MS ladders, platforms, cable trays, trench covers, fire lines, and retrofitting work in RCC structure for both the Chimneys</li> </ul>
Condenser, cranes, compressors, and misc. auxiliaries	Repair/Overhaul of equipment
Fire, safety, security, environment and regulatory	Replacement/Revival of equipment

The detailed process flow diagram including the key sub-systems associated with material handling has been illustrated below:

## Process Flow Diagram

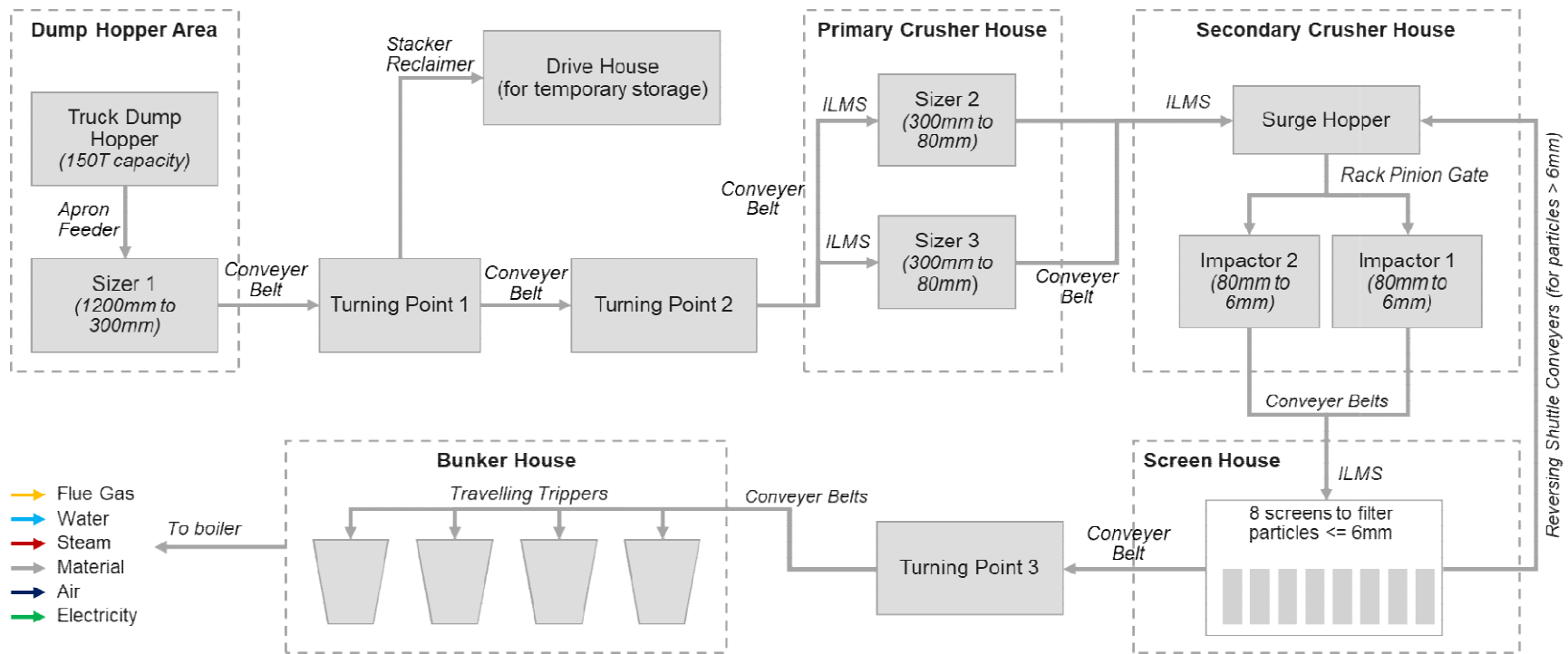


Figure 31: Lignite Handling System

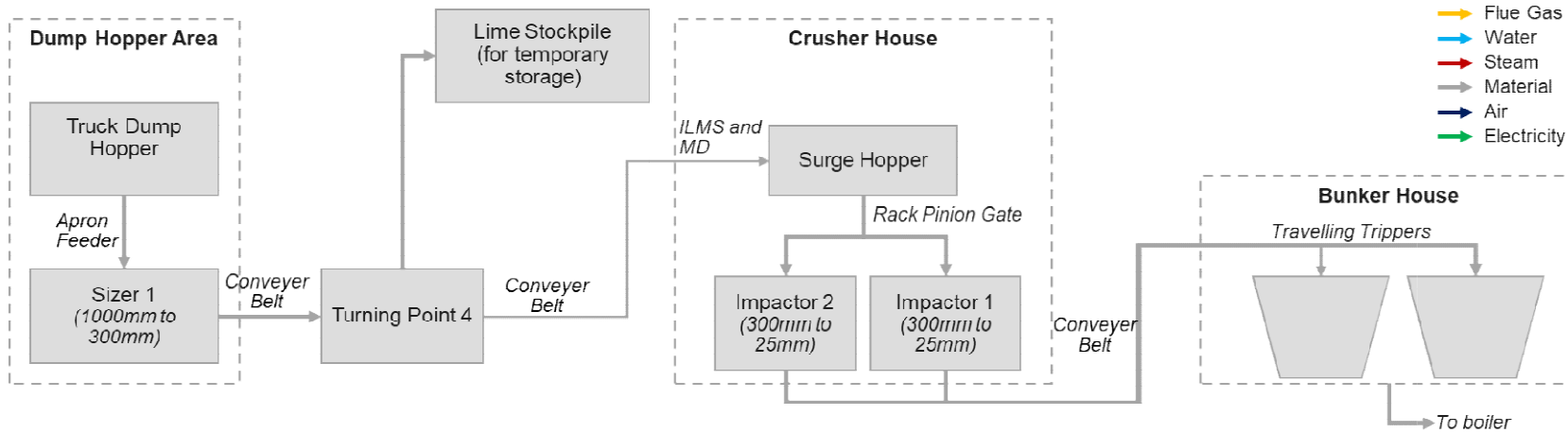


Figure 4: Lime Handling System

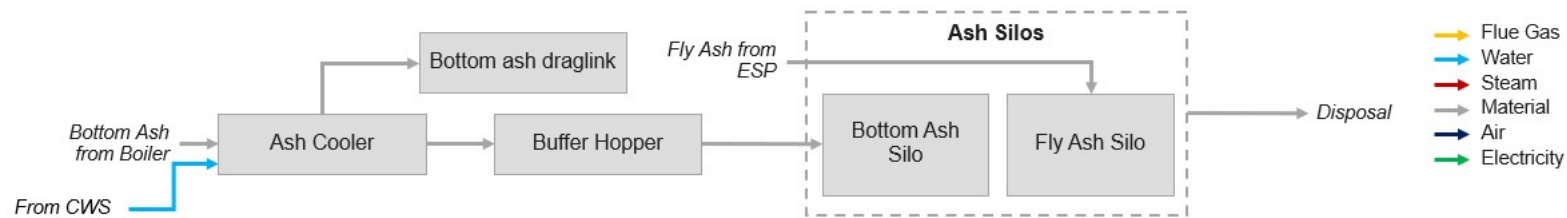


Figure 52: Ash Handling System