7.1. Annexure I: Thermal Power Station

1. Auxiliary Power Consumption (APC)

EmAEA may verify the section/ equipment wise motor ratings. The sections/ equipment shall include

Table 15: Auxiliary Power Consumption Details (a,b,c)

a. Boiler and Auxiliaries

S. No.	Equipment	Power Rating (kW)	Current Rating (Amperes)
1.	Coal Grinding Mills		
2.	Coal Feeders		
3.	Boiler Re-Circulation Pump		
4.	Primary Air(PA) Fans		
5.	Secondary Air(SA) Fans		
6.	Induced Draught (ID) Fans		
7.	Seal Air fans		
8.	Scanner air fans		
9.	Air Pre-Heater (APH)		
10.	Miscellaneous/ Missed out equipment		

b. Turbine and auxiliaries

S.No.	Equipment	Power Rating (kW)	Current Rating (Amperes)
1.	Condensate Extraction Pump (CEP		
2.	Boiler Feed Pump (BFP)		
3.	Boiler Feed-booster Pump (BFBP)		
4.	Closed Circuit Cooling Water (CCCW) Pump/ De-Mineralised Cooling Water (DMCW) Pump		
5.	Auxiliary Cooling Water (ACW) Pumps		
6.	Condensate Polishing Unit (CPU)		
7.	Lube Oil Pumps		
8.	Seal Oil Pumps		
9.	Stator Water Cooling Pumps		
10.	Miscellaneous equipment		

c. Balance of Plant

S.No.	Equipment	Power Rating (kW)	Current Rating (Amperes)
1.	Compressed Air System		
a)	Instrument Air Compressor		
b)	Service Air Compressors		
2.	Cooling Water (CW) Pumps		
3.	Cooling Tower (CT) Fans		
4.	Water Treatment Plant (WTP)		
a)	Clarifiers		
b)	Filters		
c)	Pumps		
d)	Ion Exchangers		
e)	Miscellaneous/ Missed out equipment		
5.	Coal Handling Plant		
a)	Wagon Unloading System		
b)	Crushers		
c)	Belts Conveyors		
d)	Stacker Reclaimer		
e)	Miscellaneous/ Missed out equipment		
6.	Ash handling System		
a)	Pumps		
b)	Dry Ash Handling System		
c)	Wet Ash Handling System		
d)	Miscellaneous/ Missed out equipment		
7.	Fire Fighting System		
8.	Air Conditioning System		
9.	Lighting		
10.	Transmission System		
11.	Miscellaneousequipment		

This data shall be produced by the DCs for verification of section wise APC. If any item has been missed out in the table above, it shall be inserted by the DC.

The DC shall submit all design documents, manufacturers data sheet, etc. in support of the equipment ratings if required.

2. Coal Handling Plant

a. Coal Input

The DC shall submit a copy of Fuel Supply Agreement (FSA) in which the coal quality shall appear. Also, the DC shall submit the transportation agreement/ contract indicating the amount and quality of coal procured.

b. Scheme

A schematic representation of the coal handling plant shall be provided by the DC indicating the flow of coal from wagons to boilers. The description shall include hours of operation and number of equipment in running and standby condition.

c. Coal Quality

The ultimate and proximate analysis of coal shall be submitted by the DC. The coal sample shall be taken at coal unloading, stacking and bunker feeding. The lab report in this regard shall be accepted.

3. Heat Rate

The DC shall give the fully traceable calculation for turbine Heat Rate, Gross Heat Rate and Net Heat Rate. The values taken for heat rate calculation shall be backed by evidences, which can be screen shot of DCS for the particular parameter.

4. Parameter verification

The DCs shall make the log books and Daily Generation Report (DGR) available as and when needed.

5. Fuel Oil

The DCs shall submit the liquid oil supply contract mentioning the properties of oil. Also, the consumption shall be backed by calculation and pictures/ screen shot of level indicators/ flow counter, etc.

6. Balance diagrams

a. The DCs shall submit the Heat Mass Balance Diagrams showing the complete cycle.

b. Water Balance Diagram shall also be submitted.

7. Fuel Mix Normalisation in Gas based Thermal Power Plant

Due to change in fuel mix i.e., % of consumption of Gas and Oil/other fuel in the assessment year w.r.t. baseline year, the variation in Boiler efficiency is evident. The same needs to be normalized as per total generation from Gas and Oil/other fuel and design boiler efficiency at 100% for gas and Oil/other fuel.

8. General

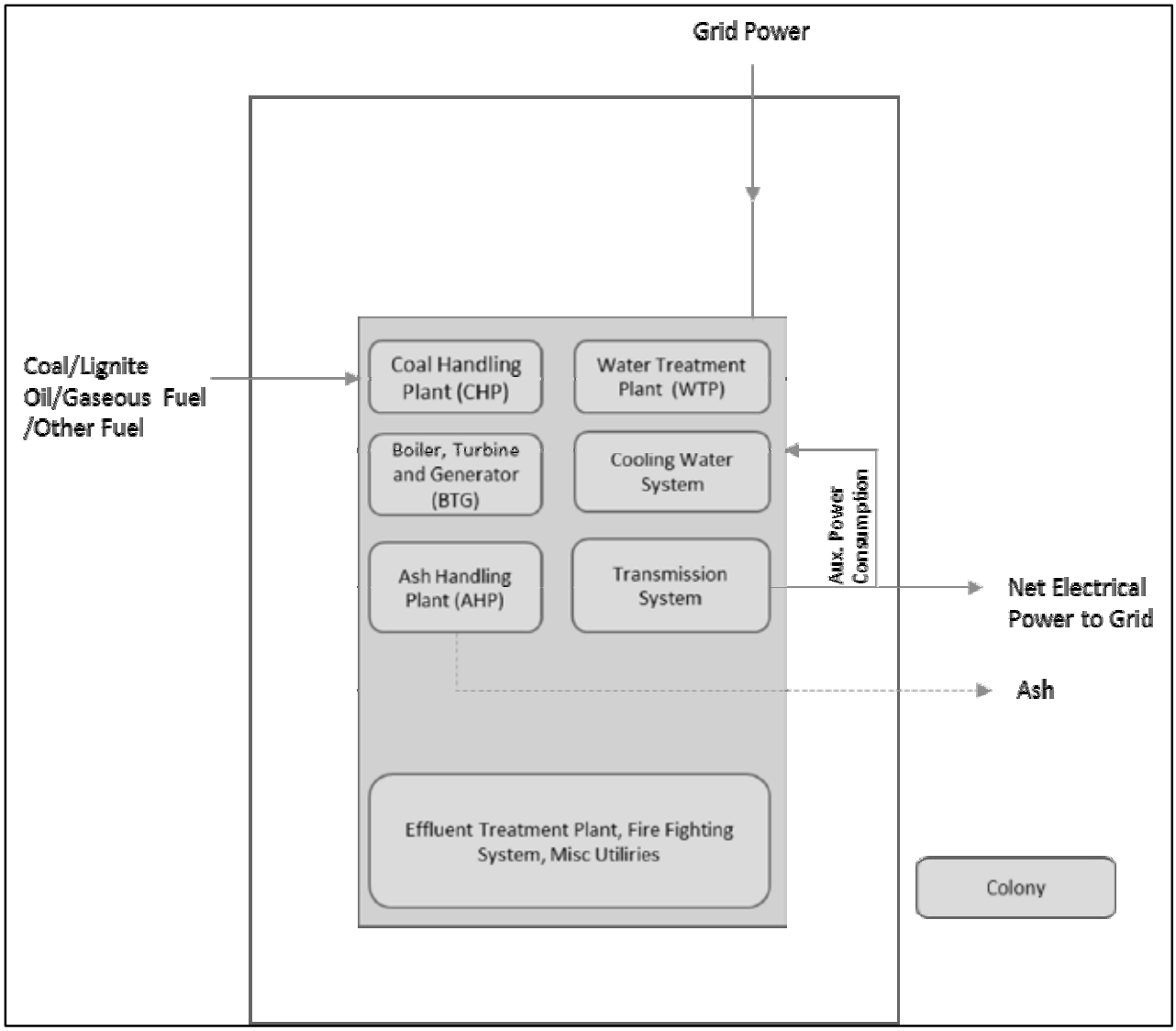
a. The scheme/ layout diagram of all sub-systems, e.g., CHP, AHP, WTP, etc. shall be submitted by the DCs. This shall facilitate in identifying the boundary condition of systems/ plant.

b. The DCs shall submit the maintenance history of systems/ equipment.

9. Plant Boundary

a. The plant boundary shall consist of the BTG island, Water Treatment plant (WTP), Effluent Treatment Plant (ETP), Coal Handling Plant (CHP), Ash Handling Plant, CW System, Compressed Air System, Fire Fighting system, Transmission System, etc. A typical sample of Plant boundary condition is represented below

Figure 8: Ex-GtG Boundary for Thermal Power Plant



The colony does not form a part of the plant boundary and hence it is kept outside. In the figure above. The DC shall submit a latest Plot Plan of the station indicating all the systems/ sub-systems.

b. The station energy balance diagram to be included in the Verification report. A typical sample of the diagram is shown below for Coal/Lignite/Oil/Gas based Power Plant and Combined Cycle Gas Turbine

Figure 9: Ex-Coal/Lignite/Oil/Gas based Thermal Power Plant Energy balance diagram

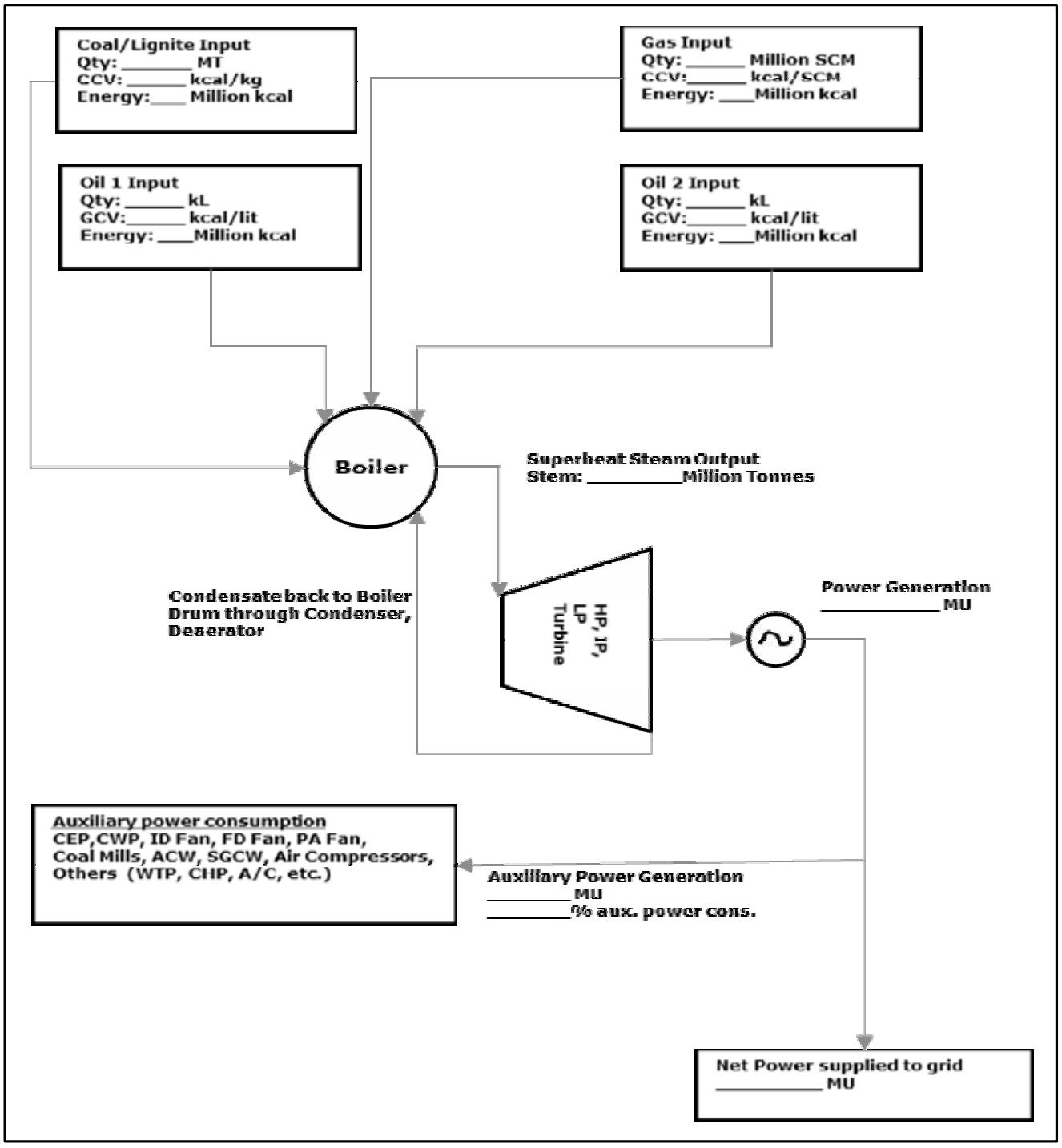
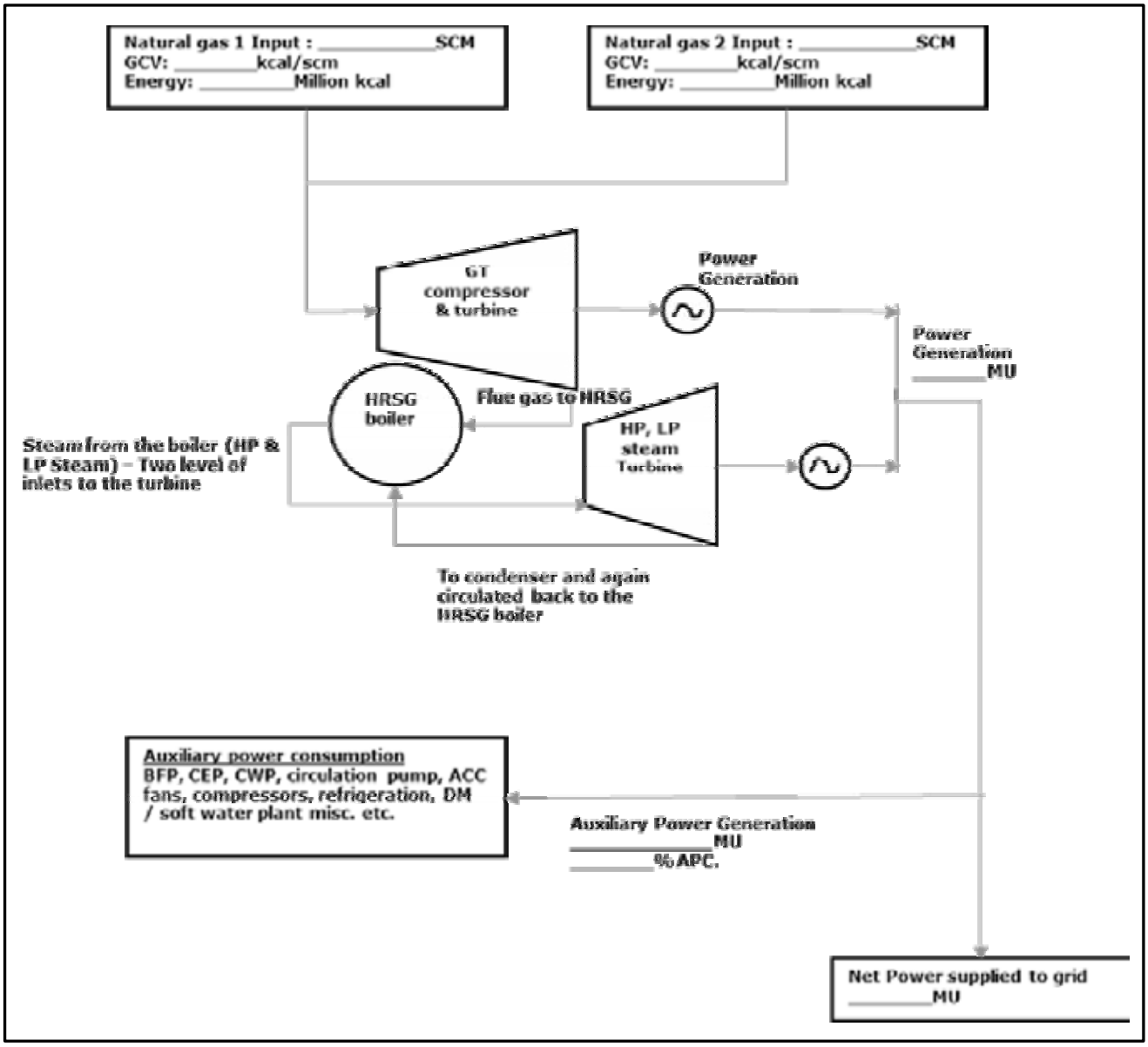


Figure 10: Ex-CCGT Energy balance diagram



7.2. Annexure II: Steel

A: Integrated Steel Plant

1. The data submitted for verification and other figure for SEC calculation of any unit has to be in line with the units declared production and consumption figures as per the statutory financial audit and declaration in their annual report.
2. EmAEA, while verifying the SEC calculation should also cross verify the input figures based on the procurement plans and physical receipts.
3. The transit and handling losses have to be within the standard norms allowable under financial audit.
4. Crude steel is the product output of an Integrated Steel Plant (ISP). The term is internationally used to mean the 1st solid steel product upon solidification of liquid steel. In other words, it includes Ingots (in conventional

mills) and Semis (in modern mills with continuous casting facility). In PAT Scheme, for ISP, Crude steel is considered as the major product output.

5. The energy impact of any basic input such as Pellet, Sinter, DRI, Oxygen, Nitrogen, Argon, which has been either imported and/ or discontinued during assessment or baseline years, the upstream/notional energy impacts have to be apportioned in SEC as the case may be.
6. Import of any finished or semi-finished fuel input say coking coal vs coke,which has been either imported and/ or discontinued during assessment or baseline years, the upstream/notional energy impacts have to be apportioned in SEC as the case may be
7. For verification process, the DC shall provide all necessary information, supporting documents and access to the Plant site to EmAEA. It will be the responsibility of the EmAEA to maintain the confidentiality of the data collected and not to use for any other purpose except for the PAT scheme.
8. Quality of raw material for the purpose of normalisation needs to be maintained as per the frequency of monitoring of the particular raw material and has to be maintained and submit to EmAEA by the plant, duly signed by the authorized signatory of the Designated Consumer.
9. In case of normalisation benefit, unit has to provide metering and measurement of energy inputs for all the energy parameters, for which normalisation is claimed.
10. All the energy input calorific values for purchased energy and inputs that impact energy performance of unit shall be submitted based on suppliers documented analysis and contractually agreed and signed documents by competent authority. All these documents are mandatory to be counter signed by auditor. A third party determination of calorific Value of each fuel used in plant to be submitted for each quarter carried out by Government Accredited Laboratory (NABL).

B:Sponge Iron Sub-Sector

11. The entire sub-sector is divided into 7 group on similarity of product
12. The major product in 7 group is as per table below

Table 16: Sponge Iron Subsector- Major Product details

Sr No	Sub-Sector Group	Major Product	Remarks
1	Sponge Iron	Sponge Iron	
2	Sponge Iron with Steel Melting Shop	Sponge Iron	
3	Sponge Iron with Steel Melting Shop and Others (Ferro Chrome, FeMn, SiMn, Pig Iron, Ferro Silicon, Rolling Mills etc)	Sponge Iron	
4	Ferro Alloy	SiMn	
5	Ferro Chrome	Ferro Chrome	
6	Mini Blast Furnace (MBF)	Pig Iron	
7	Steel Processing Unit (SPU)	Steel	