

Detailed Power Generation and Cogeneration System Design & Engineering (New Plants)

Vy Consult can provide a variety of services in Power Generation and Cogeneration. With *Vy Consult*, the client can be assured that the project would be designed, constructed and implemented to the best available engineering practise. We emphasize on detailed engineering to yield the best economic benefits.

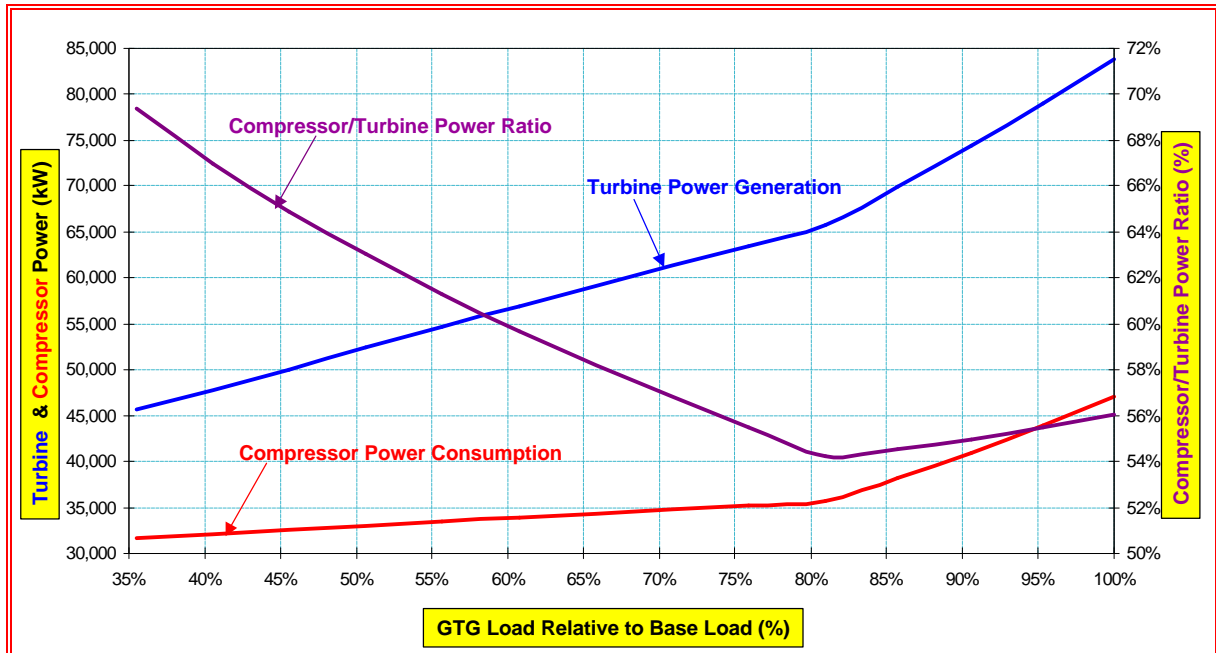


Figure 8 :Power consumed by compressor and power generated by the turbine for a PG 6561 B Gas Turbine Generator. At *Vy Consult*, we have the resources to provide a wide range of power generation and cogeneration related services.

- Selection of the design conditions upon which manufacturers would declare the performance of the machinery.
 - These parameters which include ambient temperature and relative humidity are important parameters that greatly affect the guaranteed performance of the plant.
 - The selection of these parameters would be based on detailed analysis of historic data.
 - The objective of this exercise is to ensure that the machines selected ultimately meet the requirements of the facility. For example, if an IPP is not able to meet the power requirements, it would incur losses due to sale of power and penalties

The next two charts show the depth of investigation that is involved in determining the appropriate ambient temperature and relative humidity to be specified.

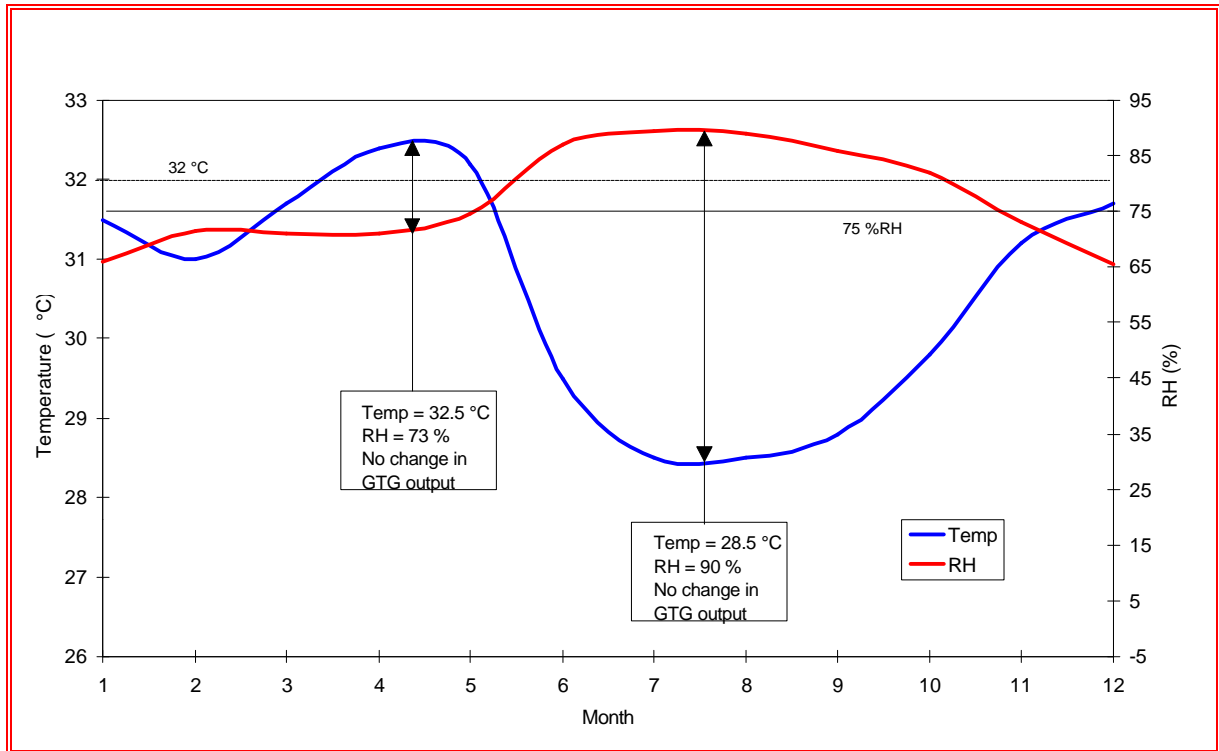


Figure 9 : Ambient temperature and relative humidity variation for one of the projects.

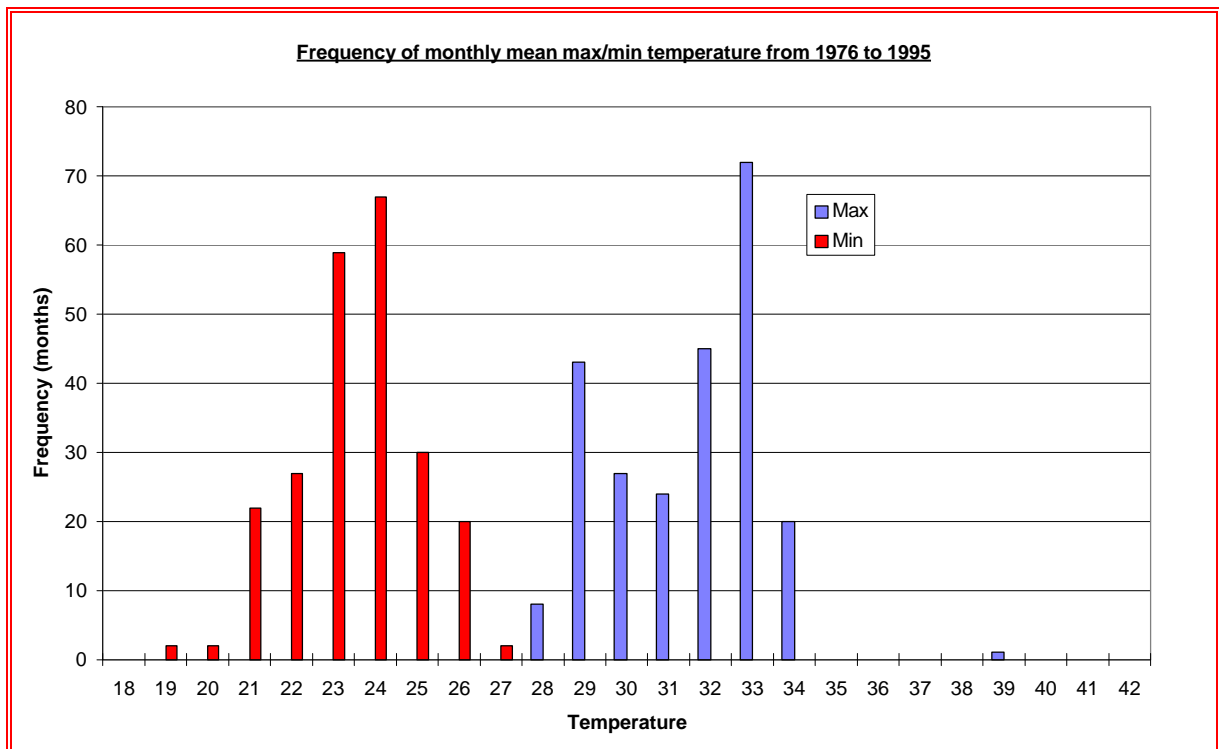


Figure 10 : Frequency of occurrence of mean monthly maximum and minimum temperatures.

- Detailed design of the plant which includes :
 - Selection of the Gas Turbine Generator, Heat Recovery Steam Generator, Steam Turbine Generator, Condenser and other power plant sub- systems

- System design takes into account of plant part-load performance to provide operational flexibility

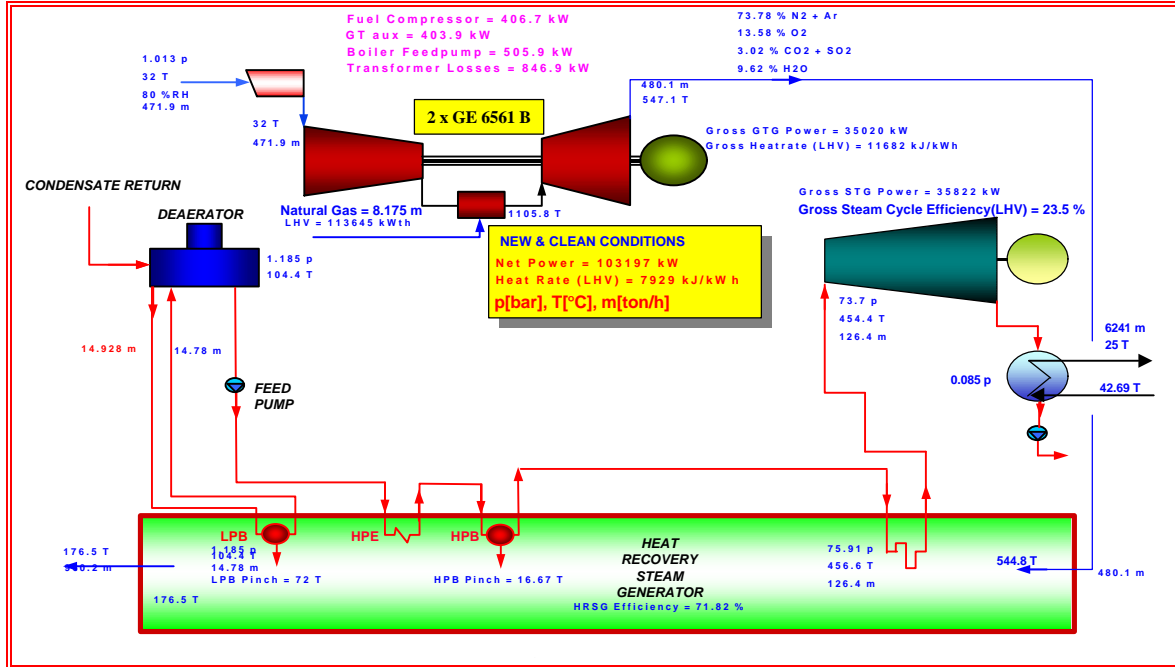


Figure 11 : Heat balance for a 100 MW Combined Cycle Power Plant

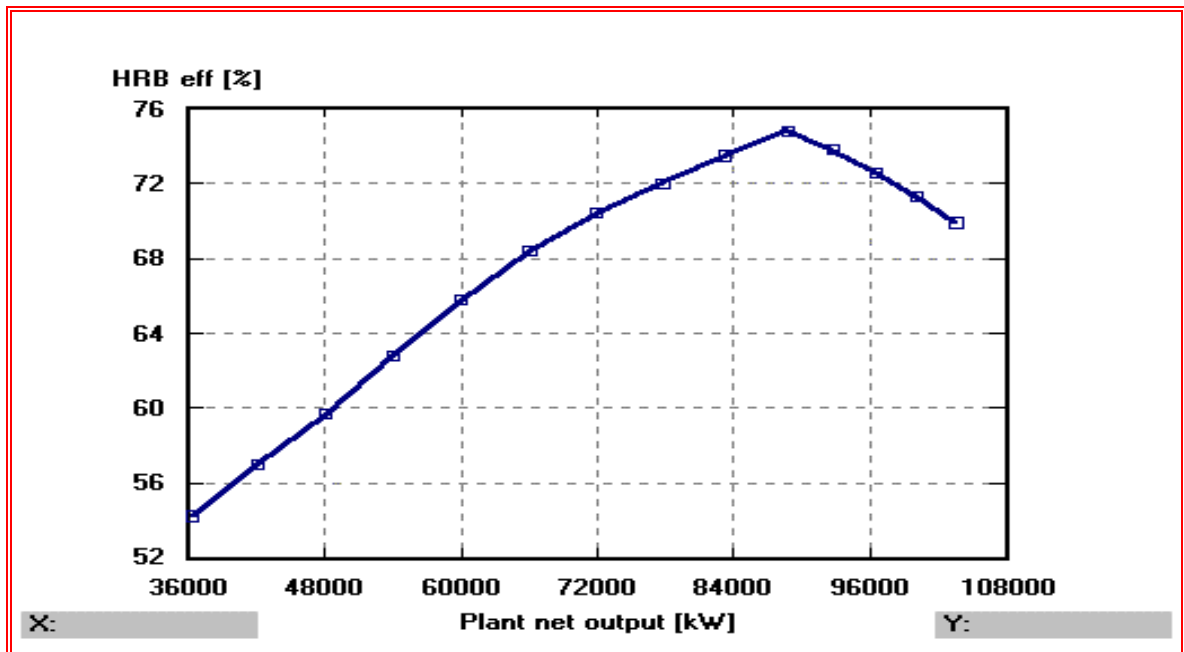


Figure 12 : Part load performance of a HRSG for a 100 MW Combined Cycle Power Plant

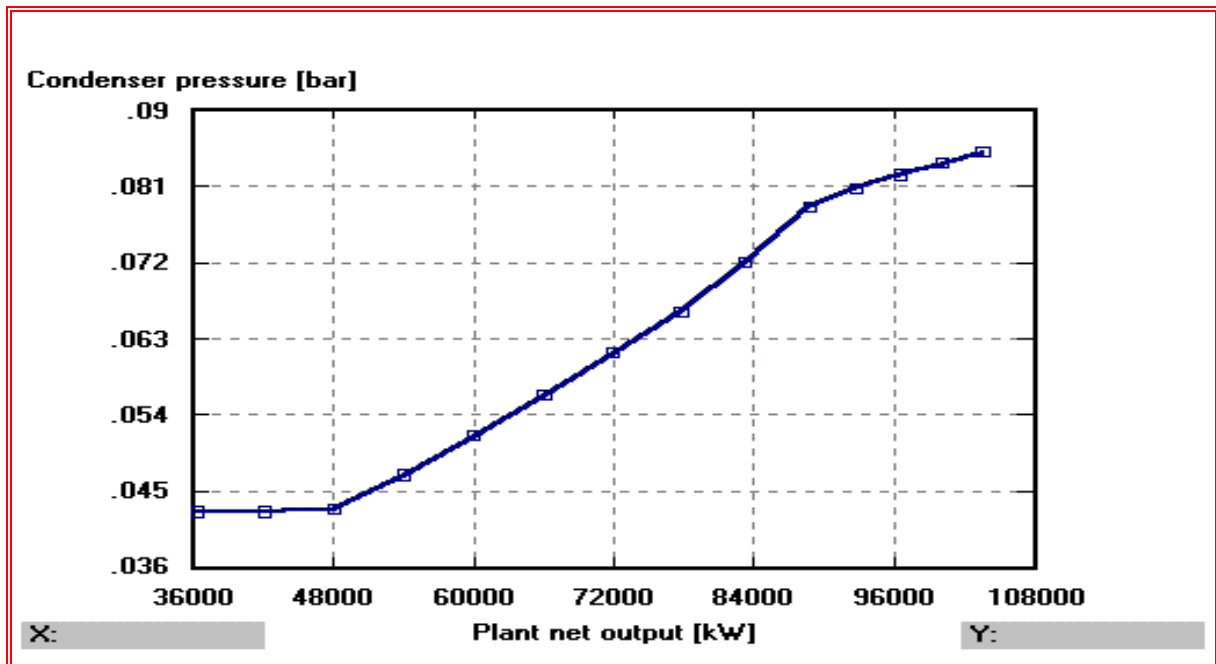


Figure 13 : Part load performance of a once through water cooled condenser for a 100 MW Combined Cycle Power Plant

- Detailed P&ID schematics
- Design of plant ancillaries including fuel tanks, water tanks, fire protection system, water pumping system (for once through condensers)
- Ensure adequate redundancy in the smaller sub-components such that there is no single source of failure in the plant.
- Preparation and detailed evaluation of tenders. *Vy Consult* has prepared specifications for international tenders (i.e. 200 MW IPP in India) and is well versed with dealing with all major international power contractors. Clients can be assured that *Vy Consult* would always protect the interest of the client and would not compromise on quality of equipment provided by the contractors.

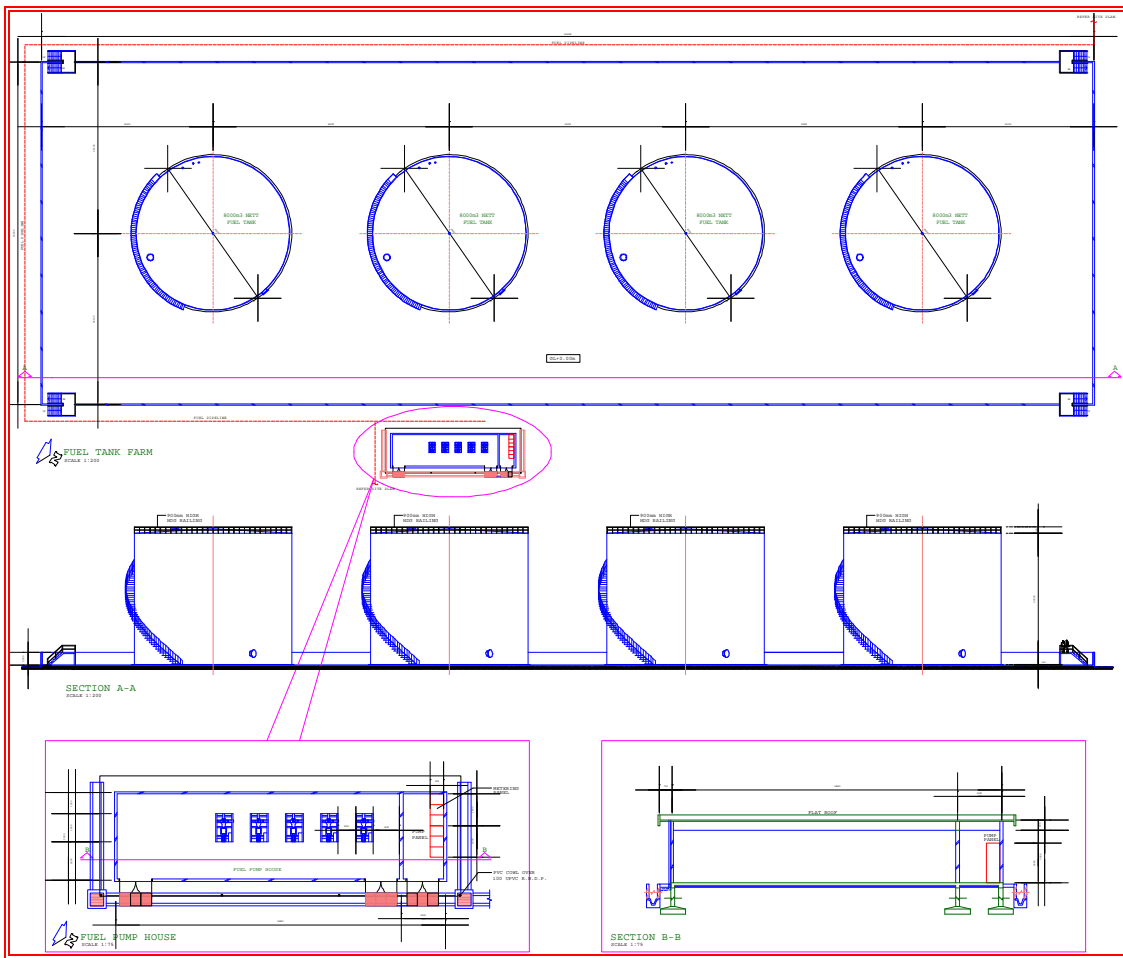


Figure 14 : Design of a naphtha tank farm for a 200 MW Combined Cycle Power Plant

- Preparation of detailed drawings. At **Vy Consult**, we emphasize on detailed engineering. Detailed engineering drawings were prepared for the 200 MW Barge mounted Power Plant in India. A lot of emphasis was put on servicibility and maintainability of the equipment.

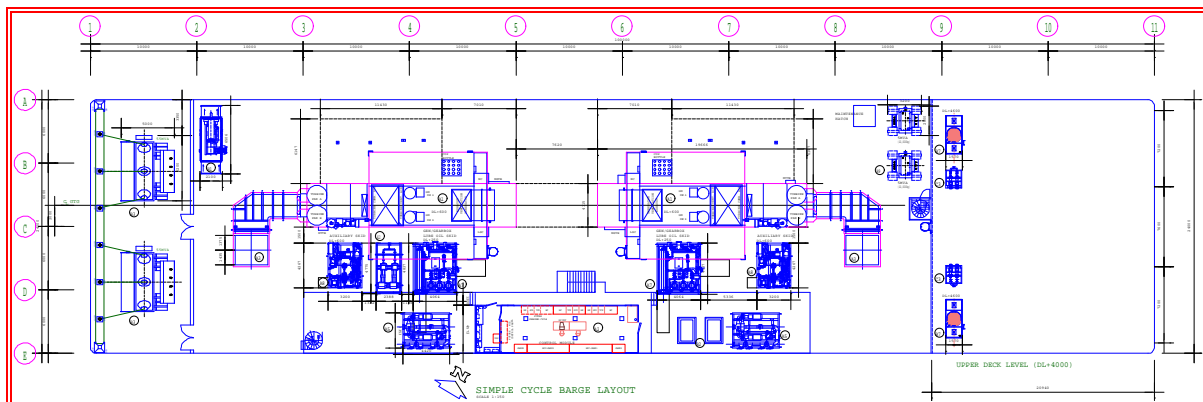


Figure 15 : Detailed plan view of the upper deck of a Simple Cycle Power Barge

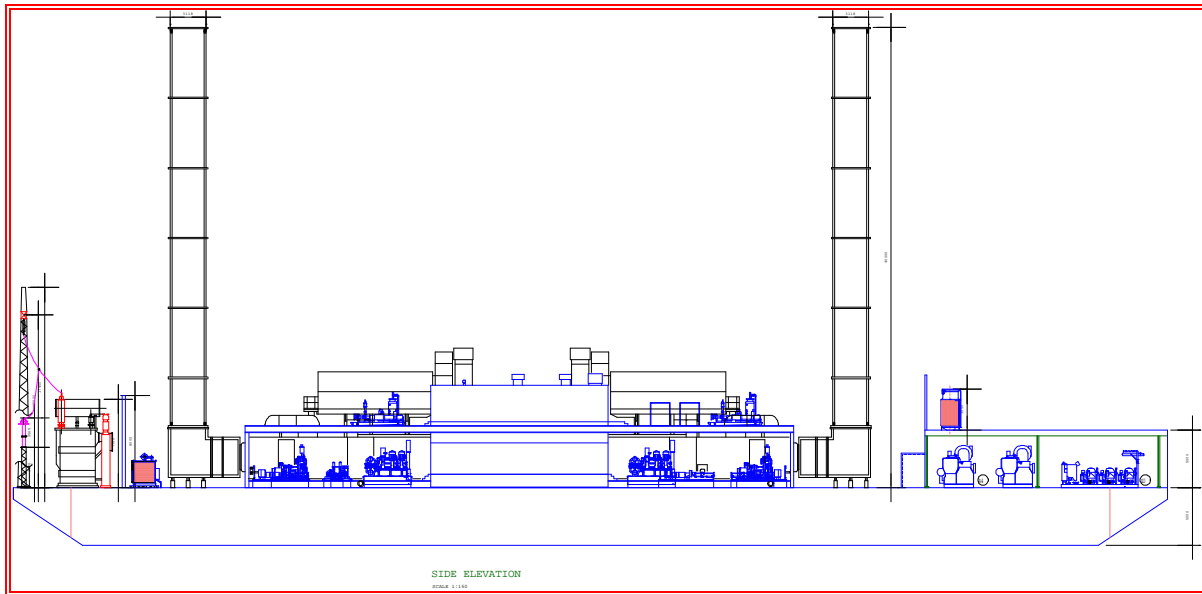


Figure 16 : Detailed elevation view of the upper deck of a Simple Cycle Power Barge

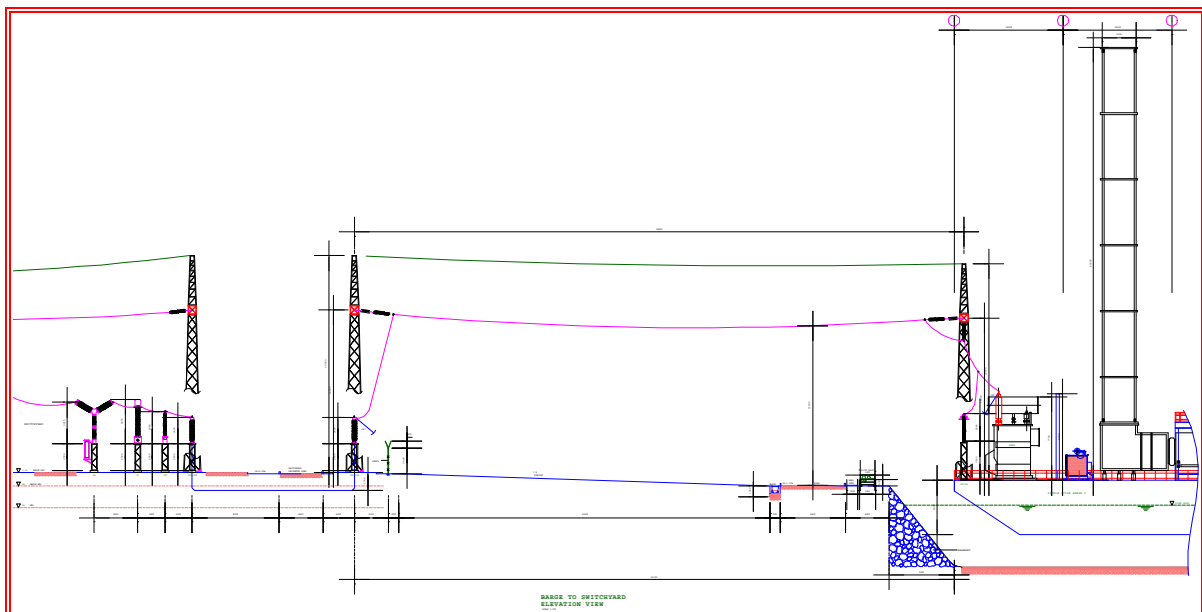


Figure 17 : Detailed drawing of HV line connection from the barge to the switchyard

- Advise on O&M issues. O&M matters have to be tackled prior to the award of the final contract such that the plant owner has sufficient leverage to negotiate with the manufacturer. More often than not, very little emphasis is put on O&M prior to the award of the EPC contract and when the plant owner does look into the O&M, the plant owner finds that the maintenance cost is tremendous and the owner has very little or no leverage to negotiate with the EPC contractor.

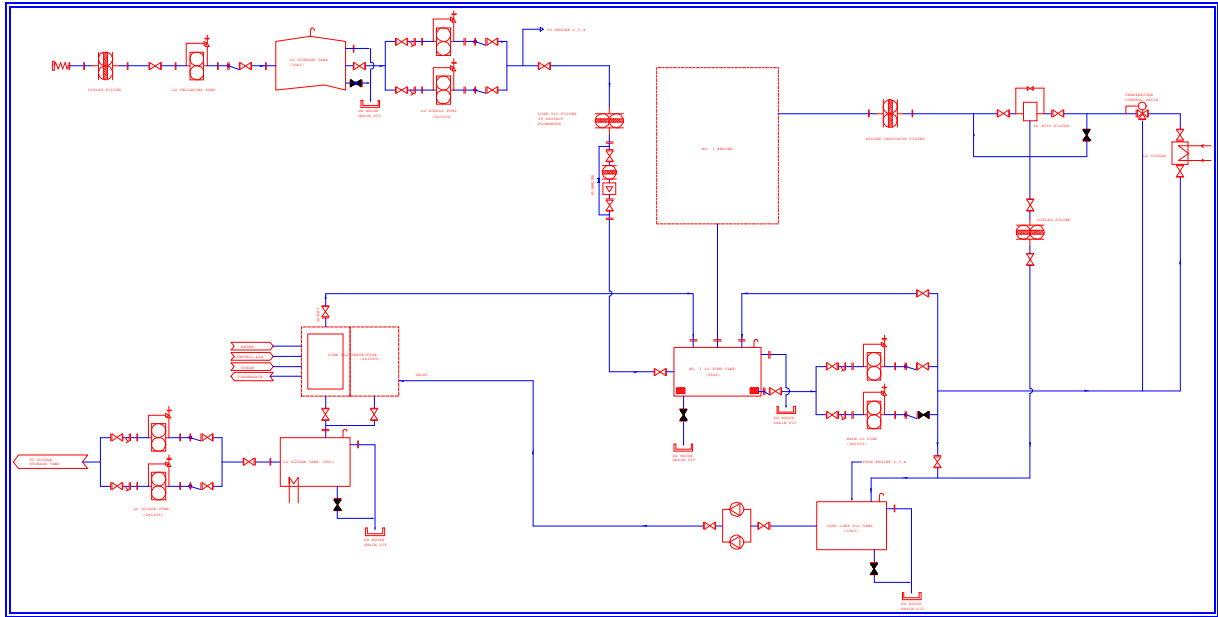


Figure 18 : Fuel Oil schematic for a diesel-genset plant

- Installation supervision and commissioning of power plant .



Figure 19 : LM2500 GTG simple cycle power plant that was engineered by **Vy Consult**