

In this project, you are teamed with 2 of your classmates to design a simple steam power plant. The plant runs on coal and produces 300 MW of power. Design a simple Rankine cycle that can produce the required output. The plant is situated near the sea with an average temperature of 16 °C.

Decide on your operating pressures and temperatures and discuss your rationale for your selection. Calculate;

- i) the condition (for example, temperature, pressure, enthalpy) at each point in the cycle
- ii) the required steam mass flow rate
- iii) the thermal efficiency of your plant
- iv) the rate of coal consumption for your plant
- v) the cooling water mass flow rate if the seawater temperature rise is limited to 4 °C due to environmental protection requirements.

This project should be treated as confidential, hence each member of the group should not release any information gathered or collected for this project as well as any assumption you made to anyone other than the group members.

The group should write a report and present your finding at the end of the semester.

The source of information and the assumption (if any) should be stated clearly in your report and presentation.

The evaluation will be based on originality, correct assumption and clear explanation/calculation method as well as accuracy.

Peer review will be conducted at the end of the semester.

This is to encourage everyone to work together as a team as the review will influence individual score for the project.

Deliverables

You will give a class presentation of your project and you will also hand in a report in softcopy.

Hand in your work on a CD containing all relevant files (report and presentation).