

# DESIGN OF A COOLING TOWER FOR A STEAM POWER PLANT

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## ABSTRACT

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Cooling towers are heat exchange devices used in power plants and many other industries. Cooling towers are used to remove the waste heat from the power plant and transfer it to the atmosphere. Cooling towers may either use evaporation of water to remove the process heat and cool to a wet bulb temperature or in a closed loop circuit, rely solely on air cooling via circulation through a radiator to cool to dry bulb temperature.

The mechanical engineering part was mainly concerning the heat exchange process. Studies include how to select a suitable material for the condenser, the water distribution systems, and mechanical drafts (fans), drift eliminators, louvers and so on. This study also touched on how the dimension of the tower was reached. Besides that, certain steps were taken to also foresee possible future problems regarding the operations of the cooling tower and how to try and rectify them.

In terms of civil engineering, the project is a design study of the structure. The structural analysis is carried out of the beams, columns, slabs and foundation, as well as carrying out research on different suitable materials for the construction of the tower. Different types of cooling towers are briefly discussed and the chosen cooling tower discussed in detail. It is intended to design the structure for low maintenance and also have a long service life. The design incorporates a reinforced concrete design skeleton structure (beams, slabs, columns, foundation) and Fibre Reinforced Plastic panels for the casing, louvers, and top cover fan housing.

For the electrical and electronic prospect of the project the basic control system of the cooling tower needs temperature sensors to incorporate with the circulating pump. It is able to function automatically. It has been set in the programming to the Peripheral Interface Controller (PIC) and also can be controlled manually when facing an emergency or when testing the cooling tower. Normally, the system depends on the PIC control. Using the data on there to get the order to the electrical device to let the water go out of the cooling tower basin depends on temperature. The temperature value will be displayed by the 16x2 Liquid Crystal Display (LCD). The Light-Emitting Diode (LED) will show which valve is in operation by the system to let the water out of the cooling tower.