Cooling Tower Efficiency Measurement System

Overview
Our design goal was design a system that would increase the cooling capacity of the Perry Nuclear Power Plant. This design would allow the plant to operate at full power throughout the summer. The design had be installed within 30 days and be cost beneficial within 6 years.

Objectives
Our design was modular cooling tower system that would dissipate the excess heat. The system would only operate during summer months to avoid power decreases.

Approach
- Determine the amount of heat needed to be removed
  - The enthalpy difference in the condenser
  - Cooling Tower Efficiency report
- Search for appropriate sized modular cooling towers
- Determine the number of cooling tower units to remove the heat
  - Water Mixing Problem
- Calculate price of the system and regained revenue

Outcomes
The system will remove the excess heat and keep the condenser under back pressure limits:
- A total of 6 units running together
- The system will cost approximately $7.5 million
- Uses 11 MW but gains back approximately 100 MW
- Modular design allows for quick installation