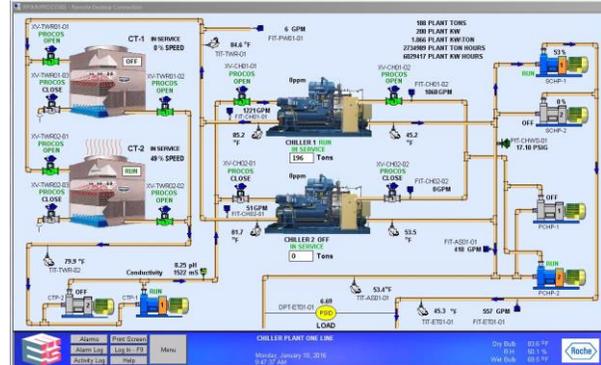




Ammonia Chiller Plant Optimization and Diagnostics

Overview

A global pharmaceutical manufacturer commissioned EES to install the PROCOS Chiller Optimization System on an ammonia chiller plant. The client made a commitment to reducing its carbon footprint by installing ammonia chillers for production and office cooling. The system was designed to run efficiently and minimize energy usage while maintaining operational reliability.



Owner Requirements

The facility is a pharmaceutical plant located in Puerto Rico. The owner wanted a seamless solution that would utilize the best-in-class hardware for controls of the ammonia chillers along with all support systems such as pumps, towers, and scrubber. The owner also required that the system provide a high degree of operational diagnostics so that efficient operations would occur as well as provide proactive indications to potential problems. The facility consisted of the following:

- Several air handlers serving various sterile production lines and support offices
- Chilled water system with back up primary and secondary chilled water pumping
- Cooling towers with back up condenser water pumps
- Scrubber system to clean the air in the chiller plant of ammonia particles
- Exhaust fan control

Solution

Characteristics of the new control system:

- Monitors ammonia conditions and automatically stages the scrubber to clean the air in the plant.
- Automatically stages chillers based on load characteristics for optimized operation.



- Takes evasive action in the event of mechanical system failure including damper control, chiller sequencing, tower sequencing, and pump operation so that space conditions are maintained.
- Communicates with the motor control centers, chillers, and scrubber system to provide an actual plant efficiency in KW/Ton with real time electrical data.
- Installed an integrated HMI that displays and trends all points in the system so that operation can be analyzed effectively.
- Provide data and reports based on system diagnostics so that deviations from design operation can be analyzed and adjust plant operation automatically.
- Optimized control of the secondary water pumps based on pressure and load conditions.
- Optimized control of the cooling tower systems to maintain proper condenser water supply to the chillers.
- Performed all necessary start up and commissioning on the PROCOS system as well as the mechanical system.
- Assisted with qualification activities including design and testing document development and execution.

Results

The new facility was up and running in an efficient manner thereby maximizing the payback through efficient PROCOS operation. This contributed to their overall bottom line. The system was designed to be user friendly and intuitive for the manufacturing environment in Puerto Rico. Upon completion of the project, the client commissioned Engineered Energy Solutions to incorporate additional systems into PROCOS. The system reports on daily utility usage and provides cost savings to allow the operators to effectively control costs. The system also trends water usage so that recycled rain water and AHU condensate can be used for tower makeup thereby reducing their freshwater costs.