

CASE STUDY: HVAC and Chiller Plant Improvements



Background:

Pernod Ricard USA, Lawrenceburg, Indiana, has a large bottling plant that was unable to maintain proper temperature and humidity. Also, there were concerns over high operating costs, maintenance problems and reliability associated with two old steam absorption chiller and 13 airhandling systems. The plant was considering combining the two chiller plants and replacing the chillers with either new absorbers or electric chillers. ThermalTech was retained to analyze the chiller and HVAC systems.

Value-Engineering Analysis and Design:

The analysis began with a comprehensive instrumented field survey of all airhandlers to identify control, piping, capacity and any other problems which limited their ability to provide proper environmental conditions.

A computer model of the building was developed using a sophisticated HVAC simulation program. The model determined the peak cooling loads and airhandler design parameters. A model was also developed for chilled-water (CHW) and condenser-water systems to allow the performance of various cross connections to be analyzed.

Alternatives were developed for producing CHW, including single and dual-compressor electric centrifugal chillers, single and two-stage steam absorption chillers, and thermal storage (ice). Concepts were developed for connecting the north and south CHW systems. Two dozen improvement options were identified for the airhandling systems.

Installation and operating costs were estimated for the various alternatives and recommendations were made. We then provided design and construction observation to implement the improvements.

Benefits to the Customer:

- The most cost-effective option was identified through the life-cycle cost analysis (i.e. install a 450-ton electric centrifugal chiller).
- The north and south CHW systems were economically connected so that only one chiller and cooling tower was required.
- The existing cooling tower was inexpensively modified to permit year-round operation.
- Many improvements were made which lowered operating costs, reduced maintenance needs, corrected code and safety violations and provided better balance between make-up air and exhaust systems.
- Direct digital controls replaced inoperative pneumatic/electric controls. A host computer with graphics was installed in the Maintenance Department.