CENTRAL CHILLER ROOM REDESIGN

SAVES MAJOR MANUFACTURER ON ENERGY COSTS

A major manufacturer housed R&D, Engineering and Pilot production in a single expansive building. Additions over the years required the installation of additional chiller capacity, which had grown to approximately 12,000 tons. The building requires air conditioning twelve (12) months of the year. The chillers each had a dedicated chilled water pump, which also provided the motive force to drive water through the chilled water headers. The system experienced two major problems:

1. When a low number of chillers were in operation, as in cooler weather, pressure at the end of the chilled water header was occasionally not sufficient to provide adequate chilled water flow to air handlers at the far end of the building.

2. Air handler control valves were 3-way valves, which operated by diverting chilled water flow through the air handler (or air washer) or directly back to the return header. This could create a condition where cold water was returned to the chillers, not allowing them to load up. Occasionally, this situation required more chillers than were necessary to be on line to provide the needs of the building.

The solution to this problem was to convert the air handlers to 2-way valves, converting from constant volume flow to variable flow, and design a Primary Loop – Secondary Loop – Common Pipe arrangement in the chiller room. This arrangement equips each chiller with a pump that only circulates water through that chiller. The secondary loop pumps supply chilled water at constant head, by use of variable speed drives, to the chilled water headers. Flow is balanced by a "common pipe" placed between the two loops.

The benefit of the arrangement allows the air handlers to see constant chilled water pressure and operate more efficiently. Only the water required is used and warm water is returned to the chiller room. The warmer water return allows the chillers to load and operate more efficiently. Payback for this project was less than one year.