Case study of Chilled Water Loop Low ΔT Fault Diagnosis

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ABSTRACT

Low chilled water ΔT, which is the temperature difference between chilled water supply and return temperatures, wastes energy by requiring additional chillers to operate, reduces chiller efficiency, and requires additional pumping power to meet the cooling load. In addition to the energy waste, the low ΔT "strands" capacity in the chillers – which is critical at a time when building expansion is underway.

This paper is to summarize a path for identifying and mitigating the ΔT issue, and increase and maintain the ΔT of the chilled water system for all possible load conditions. The primary causes of the low ΔT issue and specific action items were identified to improve the CHW ΔT by approximately 5.5 – 6.5°F (3.1-3.6°C) during the winter and by about 4°F (2°C)   during the summer.

Key Words: chilled water loop ΔT, central distribution system, variable-flow Chilled Water System, energy efficiency, performance verification, degraded performance