

Alcoa Howmet Chiller and Process Water Design

Wichita Falls, TX

Construction Completion: 2014

Tri-Tech Services: Mechanical Engineering



Project Description

The client needed to overhaul its water and chiller systems. So, Tri-Tech developed a design for the updated water-chiller process that would reduce overall operating cost, minimize downtime during construction, and reduce water usage and equipment. To accomplish this, Tri-Tech’s design incorporated a central chilled-water plant to consolidate chillers and cooling towers previously served at multiple points of use in the facility.

The new central plant will serve the HVAC loads and 45-degree process water loops for two production buildings. The cooling towers will serve the chillers and, through plate-and-frame heat exchangers, the 85-degree process water loops for both buildings. The design included primary and secondary chilled-water and condenser-water systems.

This central-plant design meant that the large chillers would use less electricity per ton of cooling. And consolidating the chilled- and condenser-water loops from the two buildings will provide higher efficiencies. The design also included a redundancy: two of the three chillers would serve the largest anticipated load, along with a backup heat exchanger for the 85-degree process water loops.

The central plant simplifies the amount of equipment involved; two chillers and a cooling tower were no longer needed and were removed. And the new control system determines what the load is, based on the water flow and temperature.

Tri-Tech’s design for the new system enables the pumps, chillers, and cooling towers to offset the load at the lowest possible power consumption, elevating the system’s efficiency.