

Long Beach City College

Chiller plant upgrades and optimization result in annual energy savings of more than \$135,000, rebates in excess of \$270,000 • Long Beach, California

One of the largest districts in the California Community College System, Long Beach City College (LBCC) has proudly served the community for over eighty years. The college boasts 1,400 employees and nearly 30,000 students learning in a student-centered environment. The college's two locations include a 112-acre Liberal Arts Campus (LAC) and a smaller, thirty-acre Pacific Coast Campus (PCC).

Challenge

Planning for future expansion, the Long Beach City College campuses were designed with open space for new building construction and additional cooling capacity in the central plant. With demand on the central plant increasing to meet the needs of the growing campuses, the college increased its focus on optimizing operations, increasing redundancy, and improving efficiency on both the LAC and PCC campuses.

Solution

Based on a long-standing relationship, LBCC discussed its needs with Trane. Using TRACE™ 700 to model and calibrate operations, Trane performed an Investment Grade Audit and analyzed Energy Conservation Measures (ECMs) to determine potential savings and energy company incentives. Based on the analysis, funding was obtained through the Proposition 39 California Clean Energy Jobs Act, a state program providing funding to local education agencies for improving energy efficiency and creating clean energy jobs.

Although the central plant was still relatively new, Trane proposed several ECMs to increase energy savings. The ECMs included the installation of a new high-efficiency Trane® CenTraVac™ chiller at the LAC campus, the optimization of the LAC and PCC central chiller plants, and other energy and operational savings measures.



With two campuses and more than 1,400 faculty and staff, Long Beach City College is a driving force in the regional economy.

Increasing capacity, improving efficiency

Operating at a maximum capacity of 1,500 tons, the central chiller plant at the LAC was designed to accommodate 2,400 tons of cooling, with space and piping connections in place for additional equipment. A 900-ton ultra-high-efficiency Trane CenTraVac centrifugal chiller was installed to increase capacity, along with an additional 1,200 tons of cooling tower capacity. Using a centrifugal compressor design, with just one moving part, CenTraVac has achieved an industry design reliability rating of 99.7 percent. CenTraVac is capable of sustaining precise temperatures at tight tolerances that are key to occupant comfort, and provides average efficiency levels that are superior to other centrifugal chillers.

Reducing energy consumption

Tracer AdaptiView™ chiller controls on the new chiller help to enable optimum motor speed, quick change response, and water temperature stability. Existing chillers on the Long Beach City College campuses were also upgraded with Tracer Adaptiview control panels.

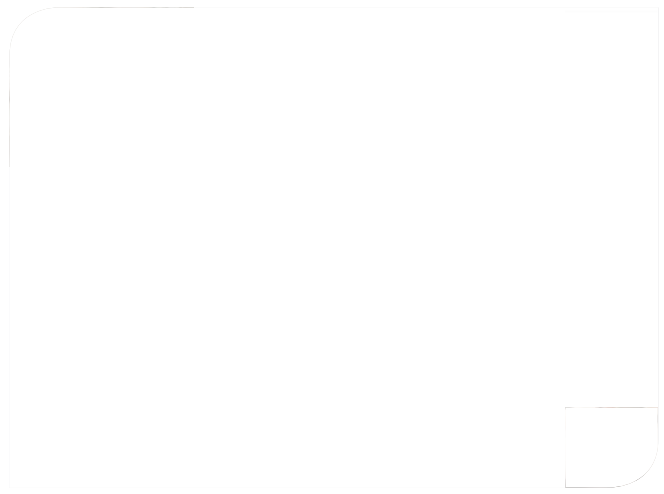
New chilled water and condenser water pumps with Trane TR200 Variable Frequency Drives (VFDs) were installed. The VFDs help the energy management system pinpoint the best setting for energy efficient cooling, ramping down the condenser water flow if needed and reducing motor speed.

Optimizing HVAC system

Teaming up with Enerliance, Trane installed a LOBOS Optimization System. The system interfaces with cooling, air handling and controls on both Long Beach City College campuses to increase efficiency and optimize operations. Pumping, chilled water supply set points, and temperatures of condenser water and air supply are adjusted based on cooling load. The required cooling load is compared with the central plant equipment to select the most efficient chiller sequencing. The system predicts load requirements and ramps up the central plant at the optimum time, saving energy on cool mornings and nights. All of these functions are completed without sacrificing occupant comfort.

Results

ECMs implemented at the Long Beach City College Liberal Arts and Pacific Coast Campuses include the installation of a Trane



A 900-ton ultra-high-efficiency Trane® CenTraVac™ centrifugal chiller was installed to increase capacity of the LAC chiller plant.

900-ton, high-efficiency CenTraVac chiller with Tracer AdaptiView controls, a 1,200-ton cooling tower, new chilled and condenser water pumps with a variable frequency drive, and system optimization. The central plant upgrades have resulted in energy savings of more than \$135,000 annually. In addition, Trane completed technical calculations, and coordinated the submission of paperwork to obtain energy efficiency rebates in excess of \$270,000.

"Trane was excellent to work with, and we're happy with the results," said Tim Wootton, Long Beach City College, director, district facilities. "While this started as an energy management project, we are also realizing the benefits of increased comfort for our students and staff."



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