



OPTIMUM INSTALLATIONS

THE UNIVERSITY OF TEXAS AT AUSTIN



Efficient District Cooling

As one of the largest public universities in the U.S., the University of Texas at Austin's 350-acre main campus supports 21,000 faculty and staff, 17 colleges and schools, and more than 50,000 students. A reliable, safe district cooling system is an imperative for the University, which requires cooling 24/7, 365 days a year. But with energy prices tripling in less than 10 years, the University also was challenged to meet the campus' growing cooling needs using less power.

The District Cooling system consists of four central chilling stations serving the campus' 200 buildings. Today the system's 46,000 tons of capacity is provided

by 11 electric centrifugal chillers ranging in size from 3,000 to 5,000 tons. Annual chilled water production is more than 145 million ton-hours, and each year the system consumes approximately 109 million kWh (about one-third of the campus' central power plant output), for an annual average wire-to-water efficiency of 0.75 kW/ton. Peak load is 35,000 tons and growing.

The Savings Begins: Chilling Station 6

The University's District Cooling optimization project started with Chilling Station 6, a new all variable speed system that replaced the University's oldest plant, Chilling Station 2. The intent of the new chilling station was to increase cooling capacity to keep up with campus growth, and provide the lowest lifecycle cost for the University. As a result, Chilling Station 6 was designed with:

- 15,000 tons of cooling capacity
- A primary-only all variable speed system
- Three 5,000-ton variable speed electric York chillers with 39 deg F chilled water design
- Three variable speed condenser water pumps (15,000 GPM, 110 ft hd and 500 hp)
- Three variable speed chilled water pumps (10,000 GPM, 250 ft hd and 800 hp)
- Three variable speed cooling tower cells (15,000 GPM each, 250 hp fans, 85-95 deg F and 78 deg F wet bulb design)
- PLC control system
- OptimumHVAC™ solution, including OptimumLOOP software and OptimumMVM services

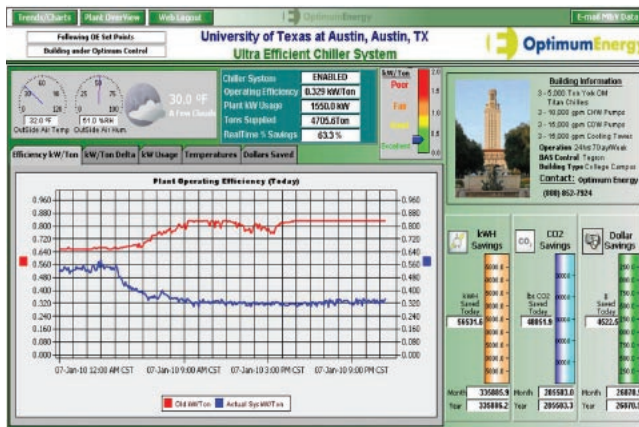
OPTIMUMHVAC ANNUAL PERFORMANCE

Estimated first-year performance of the University of Texas at Austin Chilling Station 6 with OptimumHVAC:

- Reduce energy consumption by 6,000,000 kWh
- Lower operating expenses by \$500,000
- Produce 87,000,000 ton-hours per year
- Achieve an annual performance range of 0.33 to 0.78 kW/ton
- Realize a simple payback for OptimumHVAC in 12 months

“OptimumHVAC is exceeding expectations and the operators love it. This is the first optimization system I have bought that actually works.”

— Kevin Kuretich, P.E., associate director of Plant Operations, University of Texas at Austin



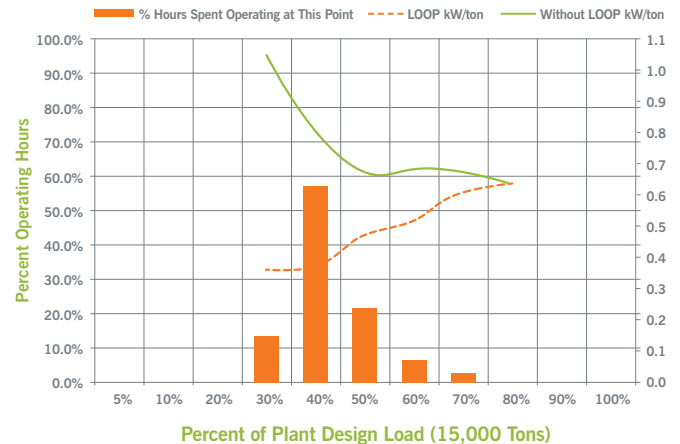
OptimumMVM shows real time plant operating efficiency, daily and monthly dollars saved, and CO₂ reduction levels, and is accessible to University technical staff and Optimum Energy engineers.

Using OptimumHVAC, the annual performance range for Chilling Station 6 is expected to be 0.33 to 0.78 kW/ton, compared to the design performance range of 0.57 to 0.79 kW/ton. The University is expected to save an estimated \$500,000 in the first year. Other benefits include:

- Load diversity – the all variable speed plant is able to efficiently handle loads between the campus minimum of 4,000 tons up to 12,000 tons without significant staging of chillers and pumps. This decreases operation complexities and creates an operator-friendly plant.
- Water and chemical savings – because the plant can efficiently serve the entire campus up to a load of 12,000 tons, the other chilling stations stay off for a significant number of hours per year, reducing cooling tower water and chemical use, and maintenance.
- Reliability – Chilling Station 6 is fully dynamic and operable without OptimumLOOP, providing redundancy. In addition, OptimumMVM measurement, verification and management services enable plant operators to verify performance and troubleshoot with ease anytime via the Web.

Do Good. Do Well. And Prove It.

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This chart summarizes the performance of Chilling Station 6 over a seven-day period in January 2010. For about 70% of total run hours, the plant was running between 30% to 40% of design load where the performance ranged from 0.32 to 0.35 kW/ton.

About Optimum Energy

Optimum Energy's patented software solutions permanently reduce the amount of energy used to heat and cool commercial buildings by 30-60%. Compatible with all Building Automation Systems, OptimumHVAC software automatically optimizes the energy performance of centrifugal chilled water plants and air handling systems based on real-time building loads. In addition, OptimumHVAC's online measurement, verification and management capabilities ensure energy and cost reductions are sustained year after year.



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