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Point Loma Nazarene University – reduction of energy consumption

Reduction of energy consumption and costs with the Demand Flow
chiller plant optimization solution from Siemens

“We have had a quality, honest and trusting relationship with Siemens for several years. Siemens also works well with our contractors and engineers.”

Richard Schult
Director, Campus Facilities &
Sustainability
Point Loma Nazarene University

The building

Point Loma Nazarene University (PLNU) is a liberal arts university with approximately 3,500 students. As a signatory of the American College & University Presidents’ Climate Commitment, PLNU is dedicated to making climate neutrality and sustainability a part of its educational mission. Key to this commitment is the University’s strategy to reduce energy consumption, electrical demand and its carbon footprint.

The challenge

As part of its energy task force’s efforts, PLNU committed to modernizing its central chilled water plant. Its facilities and sustainability teams fixed business, energy and environmental goals for its central plant modernization project. Specifically, to:

- reduce the cost of operating the plant
- replace outdated equipment
- provide chilled water production redundancy
- increase chilled water system capacity
- reduce centrifugal chiller energy consumption by 50%
- reduce plant energy consumption for the entire plant by 30–40%
- minimize the campus’ carbon footprint

Answers for infrastructure.



The solution

Working directly with PLNU, Siemens helped modernize its central plant. Siemens developed the project and was the prime contractor, which included interfacing with the local utility to create and secure incentives. To achieve PLNU's business, energy and environmental objectives, Siemens proposed a strategic approach that included:

- Implementing Demand Flow™ chiller plant optimization solution from Siemens
- Implementing the chilled water system optimization and control strategy through the existing building automation system
- Converting chilled water pumping systems from decoupled tertiary loops to direct coupled variable volume tertiary loops
- Replacing the existing chiller with a new high-efficiency 1.400 kW, including a refrigerant leak detection system

PLNU measured the success of its central plant modernization project by several key metrics such as the reduction in energy consumption, enhanced system reliability and efficiency and a fully-functional life safety system.

PLNU has realized clear results certified by an independent measurement and verification firm, including:

- Reduced entire chilled water system's energy consumption by 64%, which equals a reduction of 670,475 kWh annually and 134 kW in demand
- Reduced entire chilled water system's energy consumption, with Demand Flow alone, by 42%, equaling a reduction of 441,719 kWh annually and 72 kW in demand
- Improved chiller plant efficiency with an EER from 2.5 to now 7.5
- Reduced energy costs for the total chilled water system by US\$97,219 per year

Highlights

- Chilled water plant electricity consumption reduced by 42%
- Improved chiller plant efficiency with an EER from 2.5 to now 7.5
- Energy costs reduced by US\$97,219 per year