Mechanical Engineering Laboratory #29

Building Gross Sq.Ft.: 151,859

Simple Payback: 2.0 YRS

Retrocommissioned: Sep—Oct 2008

Annual Energy Avoidance: 36%
(Based on one year's non-normalized data)

Principal Building Use: Classrooms, Offices and Laboratories

Facility Contacts: Bob Coverdill

Building & Occupant Overview

The Mechanical Engineering Laboratory is a building dedicated to furthering the broad knowledge related to thermodynamics and heat transfer. It was originally constructed in 1905 with a large remodel and addition in 2003. Occupants inhabit various parts of the research labs at all hours of the day. There are eleven air handling units that condition the building. The building's cooling needs are met by the campus chilled water loop, while the heat in the building is provided by a combination campus steam and hydronic system. AHUs and heating systems have Barber Colman LCMs for DDC control, while the terminal VAV and radiation devices are dominantly pneumatically controlled, with some DDC controls on VAV boxes.

The facility's total metered energy during the previous year was 45,854 MMBTU.

Post RCx Energy Use Intensity (EUI) & Cost Index (ECI)

E.U.I.	E.C.I. #1	E.C.I. #2*
193.4 kBTU / Sq.Ft.	$2.83 / Sq.Ft.	N/A

Retrocommissioning Specifics & Results

The savings at the Mechanical Engineering Laboratory were a result of a variety of improvements made to the building systems.

Various occupancy schedules were implemented for the building HVAC systems to save energy during unoccupied hours. The air handling units in the building were operating with large amounts of outside air and the variable air volume boxes in the room were in need of calibration. Programming was modified to several AHUs to address these issues.

Controls were added to multiple exhaust fans to allow these to be shut down during unoccupied hours. Outdated control systems on 3 AHUs that were no longer being serviced by maintenance personnel were upgraded to the latest systems available. Also, all sensors and safety devices were calibrated and checked on the AHUs to improve control, performance, and reliability. Web graphics were finally added allowing for remote energy tracking and troubleshooting.

Project Highlights

- Implemented building system scheduling to reduce energy consumption during unoccupied hours where possible
- Reduced both OA and conditioned air requirements by calibrating OA dampers and VAV boxes per ASHRAE standard 62.1
- Provided DDC controls and web graphics for remote programming and adjusting
- Added controls to exhaust fans to promote shutdown capabilities by building occupants
- Replaced outdated control system on 3 AHUs
- Replaced vortex vanes with VFD controls in several fans to improve efficiency

November 1, 2012