

Digital Computer Laboratory #210



Building Gross Sq.Ft.: 144,877

Simple Payback: 0.8 YRS

Retrocommissioned: Jan-Jul 2011

Annual Energy Avoidance: 39%

(Based on one year's non-normalized data)

Principal Building Use: Offices, Lecture Halls, CERs & Bio-Labs

Building & Occupant Overview

The Digital Computer Laboratory is home to the Bioengineering, Financial Engineering and CITES group on the UIUC campus. The building was constructed in multiple additions and remodels ranging from 1957 to 2007. Building occupancy varies depending upon location, from 24/7 to normal office hours. There are a mix of 26 VAV and constant volume 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 7 combination campus steam and hydronic systems. AHUs and heating systems range from pneumatic control to Barber Colman LCMs and TAC MNBs for DDC control, while the terminal VAV and radiation devices are pneumatically controlled.

The facility's total metered energy during the previous year was 82,408 MMBTU.

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

| E.U.I. | E.C.I. #1 | E.C.I. #2* |
|---------------------|-----------------|-------------------|
| 345.8 kBTU / Sq.Ft. | \$5.90 / Sq.Ft. | \$580.66 / person |

* - 1,472 PEOPLE IS MAXIMUM OCCUPANCY OF THE BUILDING AT ONE TIME.

Retrocommissioning Specifics & Results

Working with the duo-team of Greg Larson (College of Engineering) and Lori Beeson (CITES), multiple energy conservation methods were decided upon and methods to improve occupant comfort were discussed. During the process it became apparent that a larger capital project will be required at this facility in the very near future.

The 26 air handling units (AHUs) providing air conditioning were maintaining space conditions 24/7/365. The primary energy conservation method was scheduling the 14 AHUs serving the office and lecture halls to shut down for 8-12 hours a day. For the complete pneumatically controlled AHUs time clocks were used for scheduling.

The 7 heat exchanger systems were investigated. 4 of them were upgraded to DDC control, while the other 3 were improved pneumatically as they are scheduled for replacement. One of those 3 serves a two-pipe fan coil unit loop, one the perimeter heat loop and the final one the reheat coil loop. The outside air reference for the 3 was found to be high by 45 degrees and therefore providing extra heat by perimeter loop and not allowing cooling in the fan coil units. RCx calibrated the sensor and restored thermal comfort.



Project Highlights

- 14 AHUs serving the office spaces and two lecture halls were scheduled to maintain conditions only when occupied
- DDC controls replaced pneumatic controls on 7 AHUs and 4 heat exchangers for improved sequences, scheduling, and comfort control
- Improved control sequences were applied at (2) existing AHUs with DDC control
- Repaired a broken/closed fire damper in the supply trunk serving main lecture hall, restoring comfort and required ventilation
- Calibrated an outdoor air reference allowing improved control of (3) heat exchangers.