Foreign Languages Building #172

Building Gross Sq.Ft.: 117,715

Simple Payback: 2.8 YRS

Retrocommissioned: Jul—Sep 2010

Annual Energy Avoidance: 42%

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

Principal Building Use: Offices and Classrooms

Facility Contact: Kevin Armstrong

Building & Occupant Overview

The Foreign Languages Building is home to the School of Literatures, Cultures and Linguistics. 14 different academic units interact within the facility. The building is occupied by predominantly graduate students and professors, whose schedules vary depending on the semester period. The building was originally built in 1968 and the HVAC equipment is from this period. There are six (6) air handling units (AHUs): four (4) constant volume serving dual duct boxes and two (2) constant volume reheat systems serving induction units. Cooling is provided by means of campus chilled water. The heat in the building is provided by a combination steam and hydronic system. Building controls are Siemens Modular Series.

The facility's total metered energy during the previous year was 24,806 MMBTU.

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

E.U.I.	E.C.I. #1	E.C.I. #2*
123.1 kBTU / Sq.Ft.	$3.30 / Sq.Ft.	$220.95 / person

** ~ 1,759 PEOPLE OCCUPY BUILDING AT ONE TIME.*

Retrocommissioning Specifics & Results

The air handling units (AHUs) providing air conditioning were maintaining space conditions 24/7/365. The primary energy conservation method was scheduling the AHUs serving the office areas to shut down for 10 to 12 hours a day and some on the weekends. This was possible due to the induction unit s on the perimeter acting as convectors.

Building occupants complained about the staleness of the air. Upon RCx investigation of the AHUs, it was noted that outside air fans were operating, but air was NOT being introduced into any of the AHUs since dampers were closed! Therefore, the air had been recirculating for an unknown period of years. Dampers and actuators were repaired and the outside air was improved, even though this led to an increase in utility costs and lengthening of payback. The induction units were also reviewed for cleanliness and CFM quantities.

A capital project is to follow that will replace all of the dual duct boxes with VAV dual duct boxes, replace the outdoor air fan and relief fans, and upgrade the remaining (3) AHUs to DDC control. Following through on these recommendations will reduce energy and costs, improving payback.

Project Highlights

- Sealed several tears and larger holes in the ductwork and AHU housing leaking conditioned air into mechanical room
- Economizer sequences were restored on two DDC controlled AHUs
- AHUs were scheduled to maintain conditions only when sufficiently occupied
- DDC controls were installed on three AHUs for improved sequences of operation, scheduling, and comfort control
- Determined that the four basement units could not go to full economizer due to relief limitations. Capital project will address this issue.

November 9, 2012