

Chemical & Life Sciences Laboratory #70



Building Gross Sq.Ft.: 231,315

Simple Payback: 0.8 YRS

Retrocommissioned: Feb—May 2009

Annual Energy Avoidance: 22%

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

Principal Building Use: Research Laboratories

Facility Contacts: K. Wooldridge, C. Stevens & D. Gerard

Building & Occupant Overview

The Chemical and Life Sciences Laboratory is home to 10 Nobel Prize winners as well as world renowned researchers in science. This six story building was erected during 1993-1997. Multiple departments related to the chemical and life sciences require a 24 hour presence in this facility. There are 8 VAV air handling systems (6 of which are 100% outside air with hydronic heat recovery coils) serving 138 constant volume fume hoods. The building's cooling needs are accomplished by three 800 ton electric chillers. Smaller specialized cooling is provided by the year round campus chilled water loop. Heat is supplied by four combination steam and hydronic systems. Building controls are Johnson Metasys while the chillers are York.

Facility total metered energy during previous year was 106,127 MMBTU.

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

E.U.I.	E.C.I. #1	E.C.I. #2*
358.8 kBtu / Sq.Ft.	\$6.47 / Sq.Ft.	N/A

* THE QUANTITY OF PEOPLE THAT OCCUPY BUILDING ON A GIVEN DAY IS NOT KNOWN.

Retrocommissioning Specifics & Results

The laboratories were designed for air circulation rates of approximately 30 air changes per hour to condition the labs every hour of the year. Offices grouped together were maintaining conditions all year. RCx was able to find an existing pneumatic line originally designed for a chilled reduction emergency, extending to every floor which afforded an opportunity to replace the controllers at all offices to allow them to shut off during unoccupied hours. RCx facilitated meetings to address the air circulation rate, involving campus safety, facility managers, code officials and similar experts. These discussions led to discussions with national universities as to their methods and approach. The result was a lowering of the occupied circulation rate from 30 to 10 ACH and during unoccupied from 30 to 6 ACH.

Making the above changes required RCx to visit every lab space to re-balance the airflows. Each office also required its VAV controller configuration to be changed from a normally open device to a normally closed device. Faulty VAV controllers were replaced as required. The IAQ was improved and the air noise levels were reduced improving occupant comfort.



Project Highlights

- Created occupancy schedules to minimize energy consumption during unoccupied hours in office areas.
- General lab exhaust air quantities were reduced from 30 to approximately 6 air changes per hour when unoccupied.
- Temperature and humidity sensors were installed on most fans to improve fan control.
- VFD's were installed on most fans to improve fan control.
- Building comfort levels were improved for personnel on site.
- Balanced VAV boxes to improve comfort and performance