

Beckman Institute #228



Building Gross Sq.Ft.: 358,090 **Expected Simple Payback:** 2.8 YRS
Retrocommissioning FY 2012 **Expected Annual Utility Avoidance:** 15% OR ▼
Team Visit Period: [Nov—May] **Campus Energy Rank FY11:** 02 17,107 MMBTU

Principal Building Use: Offices, Classrooms, Labs (Wet/Dry/Anim)
Facility Contacts: Rob Fritz, Earle Heffley & Mike Devocelle

Building & Occupant Overview

Beckman Institute for Advanced Science and Technology is an interdisciplinary research institute devoted to leading-edge research in the physical sciences, computation, engineering, biology, behavior, cognition, and neuroscience. There are multiple wet/dry labs as well as offices, conference rooms and lecture halls for quest speakers. Experiments require 24/7 operation of the HVAC systems. Cooling and heating is provided by one VAV air handling unit that is sub-divided into four. Separate AHUs are dedicated to animal quarters and specific labs. Heat is exchanged from campus steam to radiation and reheat coils. Cooling is provided by the campus chilled water system. Building controls consist of LCMs, GCMs and GCSs and a few Siemen Compacts. The DDC control system is backed up by a complete pneumatic operating system.

The facility's total metered energy during FY11 was 114,049 MMBTU.

Post RCx Energy Use Intensity (EUI) & Cost Index (ECI)		
E.U.I.	E.C.I. #1	E.C.I. #2*
270.7 kBtu / Sq.Ft.	\$5.16 / Sq.Ft.	\$1,122.33 / person

* - 1,645 PEOPLE OCCUPY BUILDING ON A GIVEN DAY

Retrocommissioning Specifics & Results

Make up air for the wet labs was being supplied by the VAV dedicated to each room. The control strategy was varying the general lab exhaust leaving the room to maintain the room temperature. A previous project field adapted the fume hoods for variable volume operation. RCx changed the lab control to vary the supply air volume allowing the general exhaust to close when fume hoods were in operation. Hood controls were replaced to reduce exhaust air when sashes were closed. Fume hood system capacity increased avoiding capital investment for additional hoods desired by department.

To improve space comfort conditions, all pneumatic thermostats and controllers associated with 354 VAVs were calibrated and / or replaced for proper operation. Each room was balanced for proper air flow, reducing HVAC energy use in most cases.



Project Highlights

- Upgraded pneumatic controls for 40 wet labs, improving lab pressure needs and reducing exhaust air volumes.
- Assisted funding, designing and installing DDC controls upgrade for (5) wet labs using Siemens Building Systems equipment. This preliminary process and outcome will serve as a model for implementing phased upgrades.
- Found variable reheat system at constant volume. Implemented changes to return to variable system.
- (56) VAV fume hoods did not reduce flows with sashes closed. Velocitrols were replaced at every hood to reduce exhaust/makeup flow.

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REDUCTIONS NOTED BELOW ARE NOT NORMALIZED ON WEATHER.

