Loomis Laboratory of Physics

Building Gross Sq. Ft: 159,543

Retrocommissioning January 2025—June 2025

Principal Building Use: Physics Research & Education

Building & Occupant Overview

The Loomis Laboratory of Physics at the University of Illinois Urbana-Champaign is a premier research facility housing the Department of Physics. Originally constructed in the early 20th century, the building serves as a cornerstone for cutting-edge physics research and education. The facility features specialized laboratories, fume hoods, clean research environments, and classroom spaces that support both undergraduate instruction and graduate research programs. The building's complex HVAC systems are designed to maintain precise environmental controls required for sensitive physics experiments and equipment.

Project Highlights

☐ Calibrated temperature, RH, pressure, and airflow sensors on AHU 1-3

☐ Fixed broken bypass/reheat damper causing temperature issues in AHU-1

☐ Added return air CO2 sensors to main AHUs

☐ Implemented return air humidity control for supply air temperature setpoints

☐ Disabled AHU exhaust fan during cool OA temps to compensate for fume hoods

☐ Added occupancy sensors to offices and labs without fume hoods

☐ Implemented temperature setback (occupied 72°F, unoccupied 68-76°F)

☐ Maintained and calibrated VAVs throughout building

☐ Added occupancy sensors to classrooms (AHU 10-14)

☐ Fixed CHW valve stuck open with broken pin in AHU-12

☐ Replaced failing controllers on AHU-10 and AHU -11

☐ Added CO2 sensor to Room 144

☐ Fixed return air dampers stuck open due to bad controllers

☐ Replaced corroded VFD for AHU-10

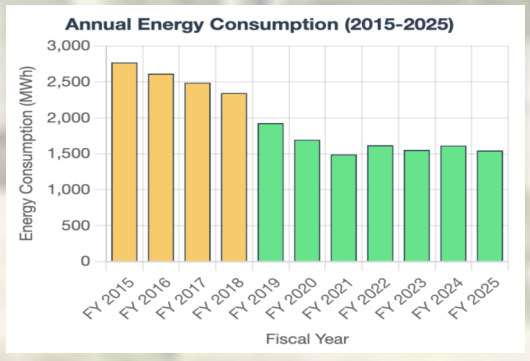
☐ Enhanced auditorium CO2 control systems

☐ Added controlled steam radiator isolation valve

☐ Repaired hot water system differential pressure issues

Retrocommissioning Specifics & Results

The retrocommissioning project focused on optimizing the building's complex HVAC systems that serve both research laboratories and educational spaces. A significant portion of the energy savings came from implementing occupancy-based controls and optimizing airflow management. The team addressed critical issues with AHU operations, including fixing broken dampers and valves that were causing energy waste. The addition of CO2 sensors and humidity controls improved indoor air quality while reducing unnecessary conditioning. The project also resolved makeup air issues affecting the Materials Research Laboratory connection, improving overall building pressure management. The hot water system improvements included fixing differential pressure control issues and maintaining proper expansion tank pressure. Steam radiator controls were enhanced with the planned addition of automated isolation valves. Controller replacements and network communication fixes eliminated operational inefficiencies and improved system reliability.



The Loomis Laboratory building energy efficiency initiatives—including the 2018 Energy Performance Contracting (EPC) project and the 2025 retrocommissioning team project—have achieved a remarkable 44% reduction in total energy consumption compared to the FY 2015 baseline, demonstrating the effectiveness of systematic building optimization in research facilities.

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