

SHOWCASE PROJECT: UNIVERSITY OF UTAH: EYRING CHEMISTRY AND BIOLOGY BUILDINGS

SOLUTION OVERVIEW

The Eyring Chemistry and Biology complex consists of five buildings - two biology and three chemistry. Burns & McDonnell performed facility energy audits to establish baselines and develop Energy Conservation Measures (ECMs) in each of the facilities. During project meetings in June 2013, Burns & McDonnell and the University discussed the various ECMs and selected a series of those for further development in the Eyring Chemistry and Biology buildings.

Life-cycle evaluations were conducted on multiple ECMs with an emphasis on not only improving the energy footprint of the campus, but also developing a calculated, economics-driven approach to the life cycle of each building's mechanical system. This approach included increased attention to maintenance and proactively replacing equipment that was beyond its useful life.

SECTOR TYPE

Education

LOCATION

Salt Lake City, Utah

PROJECT SIZE

370,000 sq. ft.

FINANCIAL OVERVIEW

\$6.46 million

SOLUTIONS

The final energy conservation measures implemented include:

- Upgrade to variable air volume (VAV) from constant air volume system
- Dual-duct controls
- Fume hood proximity sensors
- Fume hood monitors
- Room occupancy sensors

In the Eyring Chemistry building, the existing constant volume air handling systems were upgraded to a variable volume system. The existing systems were dual-duct and required a custom control

sequence to accurately control the ratio between the hot-deck and cold-deck airflow adjustments, while maintaining temperature and pressure control. Laboratory controls were upgraded to full dual-duct controls (DDC) to reduce ventilation requirements and allow airflow setbacks.

Variable air volume dual duct mixing box replacements were made in all non-lab areas, and supply fans were replaced with new fan-wall designs which included optimization controls and higher efficiency motors. All controls were migrated to a recently installed Honeywell control system for controls consolidation purposes. The constant volume system in the Biology building underwent a room-level airflow rebalance for airflow reduction. The air handling units were upgraded with new motors and variable frequency drives (VFD). Energy meters were installed on the chilled water (CHW) and high-temperature/hot-water (HTHW) building feeds.

OTHER BENEFITS

In addition to the variable volume renovation benefits of flow reduction and occupancy-based ventilation turndown capabilities, the installation of the new fan walls has not only improved efficiency of operation but has also provided redundancy in the HVAC supply fans. Additionally, upgraded building controls allow for energy saving control sequences while maintaining laboratory pressurization and temperature control.

Annual Energy Use

Baseline(2013)
550 kBtu/sq. ft.

Expected(2017)
310 kBtu/sq. ft.

Actual()
Coming Soon

Energy Savings

44%

Annual Energy Cost

Baseline(2013)
\$1,337,000

Expected(2017)
\$881,000

Actual()
Coming Soon

Cost Savings

\$456,000



The Eyring Building