VAV Box Controller Retrofit

The building automation system (BAS) at Sunset Corporate Campus (SCC) Building #2 has gone through several modifications since its construction in the 1990s. The BAS was originally installed as a full LON system, but began transitioning to BACnet when the graphical user interface became obsolete in 2011.

In 2013, as part of a tenant improvement project ATS began converting AHUs and VAV terminal units to Alerton’s BACnet line of Visual Logic Controllers. However, after project completion, 126 VAV boxes remained on the LON system.

To retrofit the remaining LON controllers to BACnet devices, the ATS Energy Group took advantage of Puget Sound Energy’s (PSE) Major HVAC Controls Upgrade incentive program. The program offers incentives of up to 50% of total project cost based on post upgrade building energy performance. To maximize incentive dollars, ATS developed and implemented high-performance VAV sequences in addition to retrofitting the controllers. The sequences at SCC now exceed the 2015 Washington State Energy Code for high efficiency VAVs.

High Performance Sequences & Scope Deployed at SCC

- Dynamic ASHRAE 62.1 AHU Minimum Outdoor Air Resets
- Trim & Respond AHU Discharge Air Temperature & Duct Static Pressure Resets
- VAV Discharge Air Temperature Control to Alleviate Stratification Issues
- Rogue Zone Identification & Automatic Elimination from Reset Sequences
- Zone Reset Importance Multipliers
- Detailed Functional Performance Testing
- Test & Balance for Zone Flow Coefficients, Duct Static Set Points, & Building Static Set Points

Result

There has been an average savings of 28% in total building energy usage (474,246 kWh through 7 months). This is significant savings for what was ostensibly a retrofit of 126 VAV box controllers. The majority of savings came from the added high performance sequences deployed with the new and existing Alerton controllers.

SCC has received $49,000 in utility incentives and is set to receive an additional $61,000 if performance persists for 12 months. After Measurement & Verification, the incentive program will effectively pay for 50% of the total project cost and SCC will benefit from ongoing energy savings from the enhanced sequences.
**kWh Usage Comparison to Baseline Data — Average 28% Reduction**

Project completed in October 2016. kWh comparison of baseline model and 2016 consumption data.

“Once the changes were implemented, we saw a marked drop in energy usage right away, and the upgrade made the retro-commissioning aspect of our LEED certification a very smooth process.”

- Eric Hagelin, Chief Engineer
CBRE for Sunset Corporate Campus

**About ATS**

ATS, established in 1986, specializes in custom engineered and installed Building Automation Systems control solutions for buildings’ mechanical and electrical systems, allowing owners to reduce energy consumption and maximize effectiveness of facilities management personnel. ATS has offices and provides services in Washington, Idaho, Montana, Colorado, Wyoming and Alaska. Contact your local ATS representative to find out how you can start running your building more efficiently and economically. Visit www.atsinc.org to find the location near you.