Customer Profile

UNIVERSITY of DAYTON

The University of Dayton is recognized as a top-tier national university and one of the 10 best Catholic universities in the nation. It's the largest private university in Ohio.

The Application:

U.D. produces heat for nearly the entire campus with seven natural gas boilers in a central steam plant. Back in 2005, five large boilers (400 BHP) primarily handled winter loads, while two smaller boilers (250 BHP) were used in the summer.

The University was adding a large dormitory to the central plant heat system and had budgeted to add another boiler to handle the steam load.

"After speaking with other Century Controls customers, including an on-site visit with a similar operation, I was convinced that Century Controls had excellent boiler control products, but the real impact on our fuel consumption was to be determined. As a result, the University reduced its natural gas consumption by 13%. Their deep knowledge of boiler room applications sets them apart from others."

Jim Blevins, Director of General Maintenance and Energy Management, University of Dayton

CENTURY CONTROLS

U.D. utilizes the Johnson Controls Metasys system to control and manage most facilities systems on campus. In addition, Mark Pearce, Service Operations Manager – Johnson Controls - Cincinnati Branch, and his team provide a wide variety of HVAC products and services to U.D. Mark is continually looking for system improvements.

The Challenges:

There was limited additional steam capacity in the plant. In cold months, all five large boilers were needed on most days.

More importantly, they had four challenges, all resulting in waste:

1. The lead/lag operating sequence was not efficiently adding and shedding boilers. Lag boilers were immediately brought on to high fire, even though the load did not call for it. After light-off, boilers sometimes operated at inefficient firing rates. Also boiler on/off cycling was excessive.
2. Boilers had too much excess air, resulting in poor combustion efficiency.
3. Excess stress was placed on the boiler tubes & refractory as a result of cycling and large firing rate adjustments. This thermal shock shortens equipment life.
4. Steam set points were higher than needed to provide heat to remote buildings and ensure proper condensate return.

The Solution:

Jim Blevins, U.D. Director of General Maintenance and Energy Management (formerly with JCI) and Mark Pearce set out to find a better way to manage the boilers at U.D. Their efforts resulted in the decision to purchase a CC-700 Combined Boiler Master with Oxygen Trim Control from Century Controls in 2006. The patented algorithms of the CC-700 coordinate automatic lead boiler rotation, idle boiler warm-up, lead/lag management and oxygen trim for all seven boilers.

The Results:

After thirty months of operation, U.D. has determined that the CC-700 was an excellent investment. Specifics:

- Boiler cycling has been reduced
- Steam pressure oscillations have been reduced - closer to set point
- Boilers are brought on-line at low firing rates (never high fire) and small nudges of firing rate occur from there.
- Combustion efficiency has improved by making real-time air/fuel ratio adjustments
- Boiler controls now have redundancy as old controls were left in-place
- All control data points are available to Metasys to monitor system performance and trending. Also configurable to allow Metasys make remote set point changes.

- Overall steam production increased. No need to add the additional boiler even after adding a 600 room dormitory to the central steam plant
- **13% reduction in natural gas consumption. Calculation based on heating/cooling degree days. This equates to annual cost savings in excess of $230k!**

"Century Controls delivered a solid solution that has already paid nice dividends to U.D. Both the Johnson Controls and Century staff were responsive to all our training and support needs. We are quite pleased with the results of our boiler room controls project,"

- **Jim Blevins, Director of General Maintenance and Energy Management, University of Dayton**

Solution Providers:

Johnson Controls, Inc.
Cincinnati, OH
www.jci.com

Mark Pearce
mark.a.pearce@jci.com

Century Controls, Inc.
Rogers, MN
www.centurycontrols.com

Brian Baker
brian.baker@centurycontrols.com