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Boiler Improvements at Denver Federal Center Save Energy and Tax Dollars



On Aug. 8, 2005, President George W. Bush signed the EPA Act 05 directive, which, at that time, required all federal agencies to reduce their annual energy consumption by 2 percent. An executive order published earlier this year increased that figure to an annual 3 percent reduction.

In the spring of 2006, Doug Baughman, a building manager at the Denver Federal Center (DFC), implemented a pilot project to reduce boiler fuel consumption in one of the larger buildings on the campus. It was decided to expand the scope of boiler-plant efficiency improvements to the entire 4-million-square-foot campus, which is managed by the U.S. General Services Administration (GSA).

Baughman enlisted the help of a team of budget, contracting, utility and energy managers – including Charlie Carruth and Charlie Reinhardt of GSA and Siemens Energy & Environmental Solutions – which recommended replacing a number of boilers and retrofitting others with new high-efficiency burners and state-of-the-art linkage-less controls.

Based on Baughman's research and discussions with several industry boiler companies, he found Thomas B. Mansfield Co. of Englewood, Colo., ready to provide the products and services needed to meet GSA's goals. After reviewing multiple manufacturers, service providers and technologies, the energy team chose T.B. Mansfield Co. – a Cleaver-Brooks representative – and created a comprehensive strategy that included:

- Six ClearFire H fire-tube boilers.
- Four ClearFire C fire-tube condensing boilers.
- Several fire-tube boiler upgrades featuring CB Hawk control systems (ICS), integrated with the existing building automated system.
- Five boilers retrofitted with C-B Pro-Fire burners and Hawk ICS.

By December 2006, the new systems were fully integrated with the facility's centralized environmental management system.

According to Richard Rothgeb, PE, CEM, of Siemens Government Services, a consultant for GSA, the new boiler systems have improved DFC's natural-gas consumption efficiency by 21 percent when comparing data from the previous winter.

The project easily should yield enough efficiency improvements to surpass the presidential mandate of 3 percent savings for the DFC, assuming weather patterns are similar to the previous year.

“The forecasted total energy consumption avoidance for the DFC is nearly 9.5 percent from the previous year,” Rothgeb explained.

By Rothgeb’s estimates, the project saved taxpayers nearly \$180,000 in avoided fuel costs from December 2006 to February 2007 alone. An annual forecast of almost \$400,000 in avoided fuel cost is projected assuming consistent weather patterns. Water consumption has been reduced, and Cleaver-Brooks projects savings of tens of thousands of dollars through the elimination of refractory repairs.

DFC’s improved boiler systems are more environmentally safe, surpassing Colorado’s criteria for emissions and even the more stringent guidelines set forth by states such as California. According to Rothgeb, DFC is anticipating annual emission reductions of 2,455 tons of carbon dioxide, 373 tons of carbon monoxide and 438 tons of nitrogen oxides.

Baughman noted that the government typically seeks a 10-year payback on capital energy-reduction projects. “Based on our improved fuel efficiencies, we’re looking at a simple payback in less than half that time,” Baughman said. [T.B. Mansfield Co](#)

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