



ROCKVILLE GENERAL HOSPITAL

LOCATION

Vernon, Connecticut

PROFILE

Rockville General Hospital, an affiliate of ECHN, Eastern Connecticut Health Network, sought ways to reduce cost.

CHALLENGE

Through the past decade, the ECHN system has consolidated laundry and sterilization services traditionally handled in-house, to off-site locations. As a result, the boiler system steam demand was dramatically reduced, resulting in excessive burner cycling and wasteful energy losses.

SOLUTION

Replace one of the two existing 500 HP boilers with a highly advanced Cleaver-Brooks Optimized Boiler Package that included a 250 horsepower firetube boiler with economizer, low-emission burner and boiler/burner management control system.

RESULTS

- In just a four-month period, the following benefits were realized:
- A minimum 12% improvement in fuel-to-steam efficiency
 - An estimated 15% fuel savings were achieved
 - A reduction of 527,000 lb of CO₂

Cleaver-Brooks Optimized Boiler Package Exceeds Expectations

Community Hospital upgrades boiler equipment for a reduction in energy costs, carbon footprint and water usage

BACKGROUND

Rockville General Hospital, an affiliate of Eastern Connecticut Health Network (ECHN), received an opportunity to improve the efficiency of their 40-year-old boiler system that serves their 233,000 sq/ft facility. John Lombardi, Director of Engineering for ECHN, was committed to implementing long-term, sustainable, energy-efficient plant improvements.

Through the past decade, the ECHN hospital system has consolidated laundry and sterilization services traditionally done in-house at each facility to off-site locations. As a result, the steam load on the two existing 37-year-old 500 HP Cleaver-Brooks firetube boilers was dramatically reduced, resulting in excessive burner cycling and wasteful energy losses. Additionally, the boilers exclusively burned #4 fuel oil, so there was opportunity to install a dual fuel system to provide fuel flexibility while reducing emissions.

“The quality, durability and serviceability of The Cleaver is unmatched. I would keep one of the existing units for peak loads and backup and replace the other with the latest combustion and control technology.”

— Scott Roman, Veteran HVAC Engineer
Rockville Hospital

John Lombardi looked to Rockville General Hospital's Veteran HVAC Engineer of 10 years, Scott Roman, for ideas to improve efficiency in the hospital's boiler plant. Scott Roman's immediate reaction was “The quality, durability and serviceability of The Cleaver is unmatched. I would keep one of the existing units for peak loads and backup and replace the other with the latest combustion and control technology.” Having such a favorable experience in his own right with this manufacturer, John Lombardi then turned to his longtime trusted team at Blake Equipment, A Blake Group Company, the local authorized Cleaver-Brooks Representative in CT and Western MA and B-G Mechanical Service, Inc. of Chicopee, MA.

Terry Wakeman, Blake Group's VP of Special Projects, and Bill Celatka, Sales Engineer of B-G Mechanical Service, Inc. presented many possibilities including Cleaver-Brooks newest technology, the Optimized Boiler Package (OBP). The OBP is an offshoot from the Super Boiler Project created through a joint research



Optimized Boiler Package operating close to 90% fuel-to-steam efficiency.

program involving Cleaver-Brooks, the Department of Energy (DOE) and the Gas Technology Institute (GTI). The sole purpose of the project was to greatly enhance boiler efficiency while reducing the carbon footprint through advanced combustion, heat transfer and control technologies. John Lombardi, a forward-thinking engineer, was receptive to the advanced concept offering high energy efficiency, low emissions and promising bottom line operational cost savings.

The team then developed a strategy to replace one 500 HP boiler with a 250 HP OBP as well as the entire boiler feedwater system without any steam interruptions to the hospital. The 250 HP boiler offers a 10:1 downturn ratio burner, which reduces or eliminates cycling in the non-heating season, thus substantially reducing fuel costs. The Connecticut Clean Energy Fund offered a \$40,000 rebate to make up half the additional cost associated with adding a two-stage boiler economizer that improved overall efficiency by an additional 5%.

THE RESULTS

After installation and several months of running time, John Lombardi's assumptions proved correct and supportive of ECHN's mission of "improving the health of our communities with competence and compassion." The Cleaver-Brooks OBP package is operating at close to 90% fuel-to-steam efficiency while delivering less than 9 ppm (parts per million) nitrogen oxide (NOx) emissions. In just a four-month period-fuel savings of approximately 15% were achieved, which correspond to a reduction in CO₂ (greenhouse gas) emissions of about 527,000 lb.

THE EQUIPMENT

The Optimized Boiler Package is a fully integrated engineered boiler system that generates high-pressure steam in industrial applications more efficiently and cleanly than previously possible. As a result of engineering and testing, Cleaver-Brooks carefully matches the firetube boiler with an integrated, high-efficiency, low-emissions burner, a deaerator and a two-stage stack economizer. The boiler package also incorporated state of the art combustion control technology, advanced water level control, parallel positioning and oxygen trim. The result of these advanced components is an extremely efficient, high-pressure steam boiler.

HOW DOES IT WORK?

The highly engineered boiler/burner package extracts maximum energy from the products of combustion that then enter the two-stage economizer, which squeezes additional sensible and latent energy out of the boiler flue gases before exiting the system up the flue. The first section of the economizer recovers energy by preheating boiler feedwater from the deaerator before it enters the boiler. The second section preheats incoming makeup water, which is then fed to the deaerator. The deaerator removes oxygen and carbon dioxide from the boiler feedwater, thus protecting the boiler and condensate return lines from corrosion as well as minimizing the potential of thermal shock.

HOW CAN I REDUCE FUEL USAGE AND EMISSIONS?

Interested to find out how this technology can work for you? Cleaver-Brooks has over 150 authorized representative sales and service centers worldwide. Go to www.cleaverbrooks.com to find a local representative near you.

Contact:

Cleaver-Brooks
221 Law Street
Thomasville, GA 31792

Office: 800.250.5883

E-mail: info@cleaverbrooks.com
cleaverbrooks.com