BUTTERS-FETTING COMPANY, INC.
MECHANICAL CONTRACTORS

1669 South 1st Street, Milwaukee, WI 53204
Phone 414-645-1535 Fax 414-645-7622

Case Study

JCP LOGISTICS WAREHOUSE
WAUWATOSA, WISCONSIN

The Challenge:

The 2.2 million square foot JCPenney Logistics warehouse in Wauwatosa, WI (a merchandise replenishment hub for the retailer's upper Midwest retail stores) operates with 4 gas-fired boilers – 2-500HP and 2-640HP – capable of generating up to 76-million BTUs per hour. It took two additional boilers, six secondary loops zoned with pneumatic controls and 3-way mixing valves, and four additions to the original 1958 building (originally equipped with 2-450HP gas-fired boilers) to accommodate the warehouse's changing roles over the years. In the early 90's, all of the burners were replaced with higher capacity (HP) models.

Maintenance supervisor Chuck Pomerenke knew that they were dealing with the expensive effects of persistent and pervasive boiler shock.

"We were spending thousands weekly over a 2-to-3 year period just repairing blown or leaking tubes. We knew the boilers should not be consuming this much energy and money," says Pomerenke. "We figured we were shocking the boilers, but we were never able to get the underlying 'real' problem identified. I needed to know what was going on."

"We made the decision to completely re-tube two of the boilers in '98 and 2000. We thought this would resolve our problems – it didn't. We even tried hiring a consultant…."

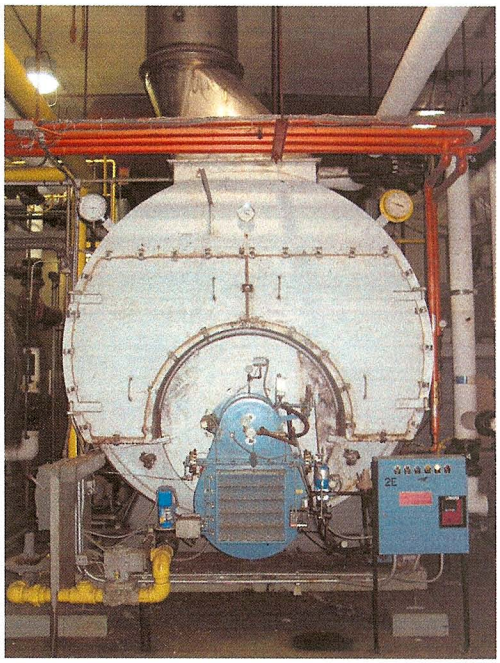
Pomerenke attended the PFMA show determined to find boiler people with answers; he found Ken Hart, sales engineer for Butters-Fetting Co., Inc. "I explained our boiler plant and tube issue. Ken came in and spent quite a bit of time looking at our system, including AHUs and loop pumps, like no one else ever had."

Butters-Fetting discovered that the system was largely out-of-control, further complicated by significant flow issues. "The two most remote secondary loop circuits were pulling cooler return water backwards rather than forward from the warmer supply water. The huge temperature differential caused the lion's share of the whole shock issue."

Case Study

The Solution:

Butters-Fetting ultimately proposed and installed full, integrated control on the boilers with monitoring to determine what the system was/is actually doing. He enlisted the assistance of Jon Williams, systems specialist for Climatic Control Company, to maximize the design of the new control system he was recommending for the JCPenney Logistics warehouse – the Honeywell Light Commercial Building Solution (LCBS) Building and Plant Manager Controllers with digital system control transducers for boiler reset and firing rate limiting along with pneumatic re-control. Once the LCBS system was in place, it provided the necessary data to prove what was suspected all along – return water was being delivered as supply water through the 3-way valves on two of the loops. A check valve was installed to make sure that the flow was going in the right direction to supply the valve loops.



"Butters-Fetting wanted to help JCPenney understand what was causing the shock, why these boilers were being mistreated, and finally, give them control. The new valve, LCBS and control strategies do this," says Hart.

Energy-wise, pre-install/post-install fuel usage comparisons and expenditures were equally dramatic. Total gas costs decreased nearly $130K in spite of significant increases in $/therm and nearly identical heating degree days year-to-year.

Although Hart had predicted that there would be future, residual tube damage/failures due to system's history, JCPenney had only two instances (replacement and re-roll) during the first heating season after the installation.

According to JCP Logistics facility engineer Larry Stahovic, "Payback was immediate. We not only got our boilers under control, we saved money on energy, maintenance costs, replacement parts, and repair costs."

"Our first heating system with the new control system was very dynamic. We expect to be fine-tuning control strategies and sequences, and optimizing programming this heating system," says Pomerenke. ♦