HEAT-TIMER® CORPORATION

CASE NO. 23

PROJECT: Westin Hotel

LOCATION: Chicago, IL

MECHANICAL CONTRACTOR: S Mechanical

APPLICATION: Multi-MOD Controls Keep New Pulse Type Boilers Operating at Peak Efficiency

Multi-MOD Control Sustains Efficiency of Replacement Boiler System at Westin Hotel

PROBLEM: Sometimes a coil leak can be a blessing, particularly if the solution is swift and leaves you with enhanced efficiency. If you're a large hotel like the Westin Hotel in Chicago, the payoff may even be worth a temporary loss of domestic water.

This was the precise situation that led the Westin Hotel to reconfigure their domestic hot water system. Prior to the emergency situation that occurred in the summer of 2004, two 350 HP steam boilers were supplying three steam-to-water heat exchangers. Each heat exchanger was routed to a different load—guestroom domestic water, laundry hot water, and hot water building heat.

The system had its limitations. Chief Engineer, John Bulom, was well aware that during the summertime the hotel lost a great deal of heating btus up the stack, since the main boilers basically idled 24/7 in order to meet the characteristically high fluctuation in demand that is typical of any hotel. In addition, there was not sufficient back-up in case of an emergency—which is exactly what occurred when two of the three heat exchangers developed a coil leak and became inoperable. As a result, the hotel lost most of its hot water capacity to the guestrooms for a period of about 24 hours.

SOLUTION: With little time to waste, Dennis Miller of S Mechanical set out to find a solution that would get the hotel's hot water system back on-line and at full capacity, as well as provide better efficiency control. Having successfully used both pulse-type boilers and Heat-Timer steam modulating controls in the past, he began coordinating between both suppliers for quick delivery.

Like any hotel, the Westin has a varied load pattern throughout the day, with peak demand occurring from 5 to 8AM, followed by another spike during midday laundry and dish washing that lasts until about 4:30PM. In the evening, only minimum hot water supply is required.

Five pulse-type boilers were selected to replace the two existing steam boilers. These new boilers work in parallel to maintain a primary loop temperature of 185°F. With proper control, these condensing-type boilers can achieve up to 98% efficiency depending on return water temperature.

Better Control Means Better Efficiency

The operational sequence for the five pulse boilers is as follows: The first boiler comes on and modulates to 25%, at which point a second boiler comes on and does the

same. Each time the previous boiler achieves 25% modulation in response to increasing demand, another boiler comes on-line and the previous boilers modulate down until all are at the same low level of modulation. The hot water generated in the primary loop supplies plate & frame heat exchangers which supply all the domestic hot water to the hotel.

To maintain peak efficiency at the Westin Hotel it is critical that the boilers operate at low fire, ideally no more than 25% modulation. A Heat-Timer Multi-Mod with an extension module operates the boilers in parallel to maintain 185°F in the primary loop and at the same time provides precise control of modulation for peak efficiency. The Multi-Mod also provides lead lag control, alternating the lead boiler and pumps to promote even use on equipment.

During both high and low demand periods, no single boiler has been observed to exceed 40% modulation. At the same time, peak demand for domestic hot water is met with four of the five boilers, with the other as back-up. An existing 1000 gallon storage tank is there just in case another hot water emergency occurs.

Potential for Remote Communications

Like all Heat-Timer commercial controls, the Multi-Mod can be upgraded with remote communications. This was important to John Bulom, who at some point wanted to be able to add the extra layer of control and convenience to the system. When and if the control is upgraded, he or any other authorized person can monitor and control the boilers from a remote location—a valuable feature for any facility that has round-the-clock operation. The Multi-Mod can also be connected to a facility's energy management system if the customer desires.

Simplicity and Success

So far, efficiencies are meeting goals and John Bolum is anticipating a fast payback based on observations of the reduced pump loads alone.

He has also found the control to be very easy to operate. An 80-character digital display names each system parameter in plain English, and an easy-to-follow menu

A Heat-Timer Multi-Mod with an extension module provides modulating and lead lag control for five pulse boilers.

allows the user to quickly pick up on the system without having to learn any special codes or keyboard commands.

"It's a much more user friendly program—not a full blown energy management system," says John Greenwood. That, along with the excellent Heat-Timer support, makes the Multi-Mod a preferred control for this boiler rep.