HEAT-TIMER CORPORATION

CASE NO. 04

BUILDING TYPE: Apartment

NO OF UNITS: 128

LOCATION: 2000 West Illinois, Aurora, Ill.

Heat-Timer® Control System helps save apartment owner $5,000 *plus* in fuel cost

PROBLEM: The owner of the apartment building at 2000 West Illinois in Aurora, IL, knew he wasn't getting proper service from his boiler system. He had spent the last few years "patching and fixing" the system which had steadily deteriorated over the past two heating seasons.

In addition to the numerous leaks and unreliable heat, the owner suspected the system was using too much fuel. To make matters worse, tenants would occasionally keep thermostats set abnormally high. Since utilities were included in the rent, the owner had to pay the price for wasteful heating.

When Mort Bleiberg of Liberty Management Company called Larry Maroff of Hollub, Inc. to look at the system, his main concerns were getting proper heat to the apartment building and reducing the excessive maintentance. It wasn't until Mr. Maroff took a close look at the system that Mr. Bleiberg realized how severe his inefficiency problem was.

"The boiler system was costing them a fortune," Mr. Maroff put it simply.

Not only was the equipment in disrepair, there was no means of outdoor temperature reset. This meant that whether it was 50° or 0°F outside, the building still consumed the same amount of energy for heat. In fact, during a routine investigation Mr. Maroff found the boiler water at 190° F when it was as warm as 50° F outside!

While the building maintenance supervisor attempted manual reset as a means to control the water temperature, the method proved as ineffective as it did time consuming. It was impossible to accurately control the system with manual adjustments.

A similar lack of control existed in the domestic water system, which used two 420,000 Btu hot water tanks. The tanks were full fired 24 hours a day, 365 days a year, with no method of control or modulation to adjust for changing load demands.

Mr. Maroff was convinced that automated controls were the best solution for both the boiler and domestic hot water systems.

SOLUTION: Mr. Maroff suggested that the owner install a totally new ***modular*** boiler system using 4 boilers. He favored this idea over one or two large boilers because it provided plenty of back-up to help the owner contend with the bitterly cold Chicago area winters. If one boiler failed, the three remaining boilers could provide enough heat on even a very cold day. He chose 2 one million Btu and 2 850,000 Btu copper tube boilers for the job. With 2 stages per boiler, the new system provided 8 different stages of heat, which allowed for more accurate control.

To modulate these stages, Mr. Maroff chose Heat-Timer HWR-Q & SEQ-8 sequencing controls.

The HWR-Q monitors outdoor temperatures and adjusts the temperature of water accordingly by staging boilers on and off. Using the control in conjunction with two stage boilers gave the owner greater opportunity for control since the HWR-Q can signal high or low fire stages individually, as needed.

Not only does the HWR-Q react to changes in outdoor temperature, it also reacts to the rate of temperature change in the system water. This built-in logic keeps the boilers from overshooting demand. For example, let's say that the HWR-Q calculates that the system needs 142°F water to meet demand and the present temperature is just a few degrees shy at 137° F. Bringing on an additional stage is probably unnecessary depending on how long it took the system to react to the previous stage. The HWR-Q processes this data and determines whether or not an additional stage will be required. It delays the next stage if it calculates that the system will reach 142°F in a matter of moments without additional help.

The HWR-Q constantly monitors outdoor temperature and system temperature, making finite adjustments. This way, energy input stays in-line with demand and less waste occurs. Best of all, it's completely *automatic*. The owner need not be concerned with complicated procedures or calculations. The HWR-Q does all the work.

Used in conjunction with the SEQ-8, the Heat-Timer HWR-Q control series has up to 8 stages of control capability.

An SEQ-4 and Digi-Span (SQ-250 F) were selected to be used with the new copper boilers for domestic hot water. This system keeps hot water supply at a set point of 160° F at all times.

"Heat-Timer is an excellent control for this type of modular boiler system," remarked Mr. Maroff, who has used the controls on similar projects in the past.

Typically, fuel savings range from 11-22% after the Heat-Timer controls are installed, but Mr. Maroff says he's seen savings go as high as 50%. In the case of 2000 West Illinois, a comparison of fuel bills revealed an 18% reduction in charges, translating into $5,377.00 in savings the first year — a sum which more than compensated for the cost of the controls and their installation.

One feature of the HWR series of controls that allowed for even greater savings was the night setback. This allows an adjustable reduction in water temperature when demand is at its lowest.

According to Mr. Maroff, the combination of the night setback and outdoor reset adds up to "savings every minute of the day."