



CASE NO. 28

PROJECT: Executive House Apartments

LOCATION: Albany, NY

CONTRACTOR: Trojan Energy Systems

APPLICATION: Control retrofit of existing steam vacuum system using SRC Steam Reset Controls and ICMS Internet Communications System

Heat-Timer Controls Conquer Unusually Challenging Steam Distribution at Executive House Apartments

PROBLEM: Older steam heated apartment buildings are notorious for their unique heating challenges. Marcia Weiss, Property Manager of the Executive House Apartments in Albany, NY was well aware that the heating system in this 1966 apartment building needed updating to improve comfort and efficiency. But neither she, nor her contractor, Trojan Energy Systems, Inc. anticipated the downright “quirkiness” of the vacuum assisted steam radiation system that served the building.

At first glance, the problems at the Executive House seemed typical of an older apartment building: manually controlled boiler system.... hot and cold spots.... windows open all winter long.... costly chemical treatment..... The problems were substantial, but pretty standard for an aging NY apartment.

It was a scenario that Glenn Godell, President of Trojan Energy Systems has seen many times. Updating the control system with modulating boiler controls, replacing aged out steam valves, and incorporating outdoor reset typically works wonders. And for much of the Executive House apartment building it did. Yet a few areas were still either too hot or too cold.

SOLUTION: Most of the Executive House problems were indeed solved by the implementation of a Heat-Timer Multi-MOD modulating boiler control and SRC steam reset controls.

The Multi-MOD provided much needed boiler control by modulating multiple boilers using PID-type logic. This energy efficiency control strategy incorporates rate of change into modulating decisions. Specifically, PID logic analyzes how quickly the current boiler load is affecting the system and the control reacts accordingly. As soon as the control recognizes that the system temperature is approaching set point, it begins to back off the boiler, gradually coasting toward set point. This minimizes energy usage while avoiding overshoots and short-cycling issues.

The SRC modulates a steam valve to vary or modulate the amount of steam flow into a building’s radiation in accordance with changes in outside temperature. The end result is a system that maintains much more even temperature, regardless of the season or time of day.

Both the SRC controls and the Multi-MOD were selected with remote communications options with internet capability. This made it possible for the superintendent and the property manager to monitor and adjust the system

from anywhere, any time. For most tenants, these control enhancements were a major improvement in comfort. However, much to the surprise of Glen Godell, the Executive House Apartments' problems were not over. He and property manager Marcia Weiss were both perplexed when several tenants in the far end of the north side of the apartment complained that 2 registers were giving off heat, while one was not. At the same time, parts of the southeast section of the building were still overheating – as high as 86°F in some spaces. What followed was some intricate sleuthing on the part of Trojan Energy – largely aided by Heat-Timer ICMS (Internet Communications Management System) and wireless sensors.

Taming an Unwieldy Distribution

Once it was determined that the new traps were working properly, various wireless space sensors were placed throughout the building to determine the inconsistencies. The ICMS enables users to monitor space temperatures as well as view past operating reports which aids enormously when troubleshooting problems. Their observations revealed a peculiar piping arrangement, exacerbated by the sun exposure on the southeast side of the building.

“We found that parts of the building piping actually crossed over from the north to east side,” said Godell. “So some apartments are actually being fed steam from two different sources.”

This complicated steam distribution because in order to satisfy the far north side of the building, the valve had to maintain an open position for a long time which caused overheating in some parts of the southeast building that were fed by the same steam line. The overheating was intensified by the high solar heat gain on the southeast exposures. The overheating on the southeast side caused the temperature averages throughout the building to be deceptively high which would limit building heat before the north end was satisfied.

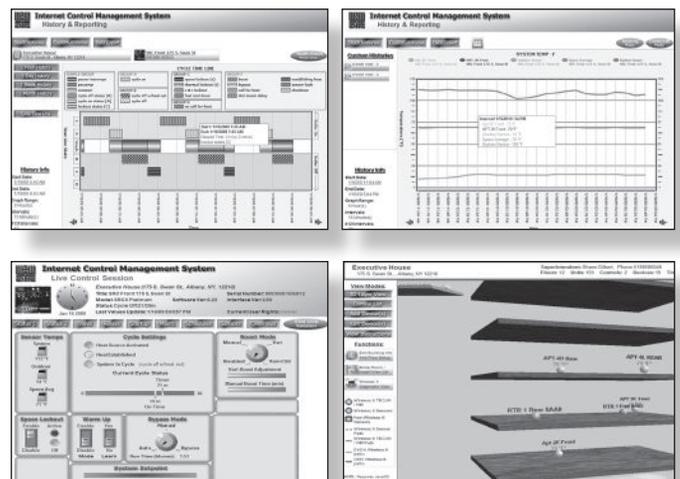
Godell spent many hours monitoring and tweaking the controls, finally whipping the unwieldy distribution system into submission. The southeast side no longer overheats because of the SRC and the fine tuning capability of the ICMS.

“Essentially, we are sending the end apartments steam from both valves, one which keeps the first radiator slightly warm while the other gets a blast of steam from the other valve,” said Godell. The end result is an unprecedented 73°F temperature throughout the building, even in sections that were once always cold.

Marcia Weiss couldn't be more pleased. Tenant complaints are down and she no longer has to dress for 80°F in winter. The building is performing perfectly, and she and the superintendent are enjoying the day-to-day conveniences of an online monitoring system, so they can spot a problem long before a tenant complains.

“It's a great system,” said Ms. Weiss. “Even if I'm on vacation, my superintendent and I can monitor the system and make changes.”

Ms. Weiss and her Board of Directors are also pleased with the reduction in fuel usage. Based on degree-days, the system used 21,568 fewer therms in the 07/08 heating season than it did in the 06/07 heating season before the Heat-Timer controls were installed. Best of all, the ICMS allows operators to continually adjust the system so that efficiency remains static, even when conditions do not.



A variety of screens and history reports allow Heat-Timer ICMS users to monitor and adjust system operation.