



CASE NO. 22

PROJECT: Church of Saint Mary Schools

LOCATION: Manhasset, NY

MECHANICAL CONTRACTOR:

Burke Mechanical Corp

APPLICATION: Vacuum condensate units cut fuel consumption and improve overall steam distribution at Saint Mary Schools.

Negative Pressure Makes for Positive Results at St. Mary Schools

PROBLEM: The steam systems at two Church of Saint Mary schools in Manhasset, NY were in need of a serious overhaul. High fuel cost and inadequate comfort were major offenses at both the high school and elementary school.

“It was costing us approximately \$40,000.00 annually to heat the high school and another \$14,000.00 to heat the elementary school,” remarked Joe Cascone, Facilities Manager for the Church of Saint Mary. Given the size of the two schools, 40,000 sq. ft. and 18,000 sq. ft. respectively, no one could argue that fuel cost had gotten out of hand.

In both schools, the major source of inefficiency was poor distribution. It took 6 lbs. of steam pressure to get steam to all the elementary school zones and 8 lbs. to the high school zones. These high pressures resulted in longer run times on both boiler systems, increasing overall fuel consumption.

SOLUTION: The problems at these two schools were typical of many facilities where aged steam systems still provide the primary source of heat. Invariably, over time, the ability of the system to efficiently deliver steam to all zones is impaired by faulty or poorly maintained traps and other distribution issues. Given these typical realities of most older steam systems, the challenge is getting steam to flow quickly through the system without having to generate an inordinate amount of pressure. Fortunately, Ed and Frank Burke, of Burke Mechanical Corp., had a solution: A vacuum condensate unit from HT Pump Specialties.

The theory behind vacuum assisted steam systems is not a new one. The idea is to create a vacuum condition in the system, so that steam can travel through the distribution more quickly. This translates into better overall distribution, reduced steam pressures, and shorter run-times for the boilers. Also, since water boils at a lower temperature under the reduced pressure of a vacuum system, less fuel is required to generate steam.

Burke Mechanical Corporation and Joe Cascone were aware of the difference that a properly applied vacuum system could make to a facility’s bottom line. Burke Mechanical had successfully applied such systems in the past

and Joseph Cascone had experienced the transformation at a similar project while employed at another church. Both were eager to see what a vacuum system could do for St. Mary's.

A 120-gallon vacuum/boiler feed unit was selected for the combination oil/gas fired steam boiler system at the elementary school. The system is designed to maintain 8-10 inches of vacuum pressure at all times. (As a safety, a Heat-Timer Digi-Span set point control is installed on the unit control panel, which deactivates the pumps if temperature sensors register that condensate temperatures are approaching high limit.)

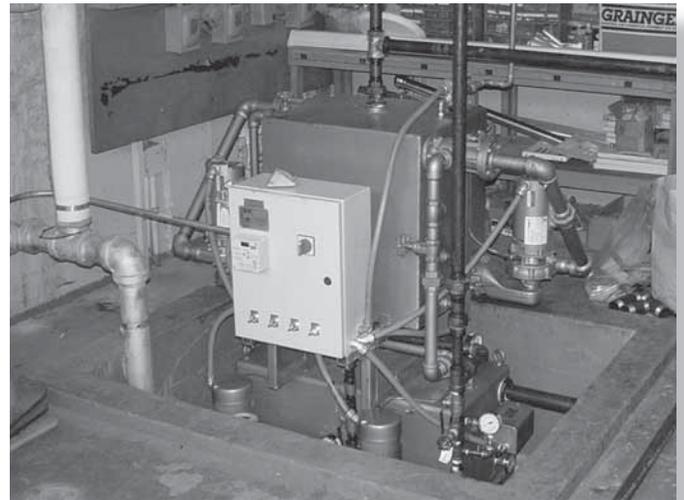
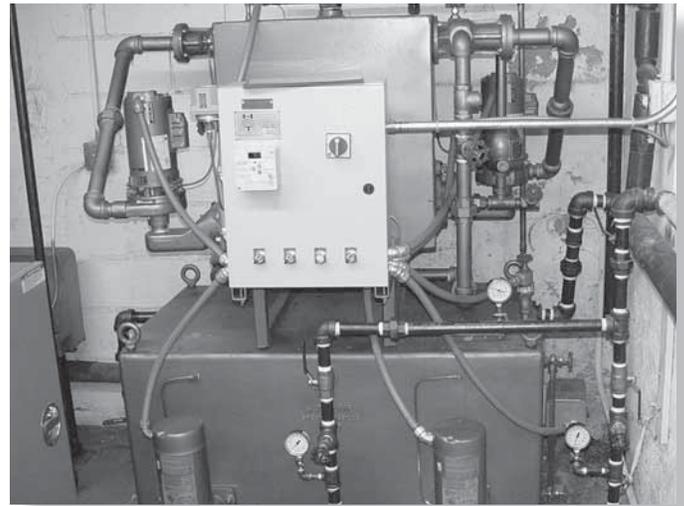
As a result, the elementary school now heats up much more quickly and is able to do so at 1/4 the pressure, says Mr. Cascone. Since the boiler is operating less often, the school is paying noticeably less for fuel.

It WORKS!

A similar system was applied to the high school steam system. A 36-gallon vacuum condensate system was selected for the steam system which consists of 2 boilers. Because of space limitations, the high school system did not include a boiler feed tank. Otherwise, the system operates the same as the elementary school, with the Venturi valve assembly serving to create the vacuum in the system.

Results at the high school have been even more dramatic. Operationally, the school is able to maintain heat by running only one boiler at a time, and rotating them every two weeks, whereas before two boilers were required to meet demand. Additionally, the system now operates on a mere 1/4 lb. of steam—so small that a vapor stat (calibrated in ounces) had to be installed just to be able to register the exact pressure. Boiler run-times last approximately 18 minutes per hour compared to the 40 minute per hour run-times of heating seasons past, and it takes only 15 minutes to get steam to all parts of the high school, whereas it once took 2 hours.

Fuel consumption is also down—a fact that Mr. Cascone has been able to document and attribute directly to the



Vacuum condensate units provided by HT Pump Specialties deliver steam faster and reduce fuel consumption at St. Mary's elementary school and high school.

vacuum system since this was the only change made to the high school. Based on a comparison that takes degree days into account, the high school system is consuming approximately 1200 gallons less fuel per month during peak heating season. This reduction in fuel consumption just happened to coincide with a .22 percent increase in oil cost, saving St. Mary's even more.

The difference is like night and day to the occupants and the mechanical staff at both schools. Comfort is up, while fuel usage and maintenance headaches are down.

“It's nice when you can go back to the board and show them the system you recommended is really working,” remarked Mr. Cascone. “We've got the numbers now to do that.”