PERFORMANCE
engineering group

Detroit Country Day School

Detroit Country Day School has a century-long history as a private school when it was founded in the city of Detroit in 1914. The school moved from the Detroit city limits to the suburb of Beverly Hills in 1957. In the 1970's the school split into separate buildings for different grades. There are now four "schools," two in Beverly Hills and two in Bloomfield Hills in Oakland County serving approximately 1,400 pre-Kindergarten through 12th grade students. Today, the school has a reputation for continuing excellence in private education in Southeast Michigan.

Unlike the school, the heating systems will not last a century. Detroit Country Day School's (DCDS) Lower school is a 55 thousand square foot building that houses the Pre-Kindergarten to second grade students. The boiler was anywhere from 40 to 50 years old and running at 70 percent efficiency according to Jim Lunemann, DCDS Facilities Manager of 28 years. The boiler was beginning to fail and there was concern that it wouldn't make it through the coming winter. "It was time for an upgrade," Lunemann exclaimed.

Performance Engineering Group's (PEG) recommendations for the Lower School included three new boilers (two 0.399 MMBTU/hr. and one 0.630MMBTU/hr.). PEG was selected because the pre-piped system allowed for a speedy installation. The new equipment was installed with the existing system still in operation. The old boiler was removed at the time of switch over. Total system switch over was completed on a week-end shut down.

The Upper School (grades 9-12) had a similar problem with the domestic water heater and the heating system. The heating system was too old, had no temperature reset, and was not right-sized for the building (which is 230,000 square feet in size) being too large a system and wasting both energy and money. "We were definitely way oversized," added Greg Lowry the assistant facilities manager who has worked in the school for ten years.

Profiles

Detroit Country Day
Bloomfield Hills, MI

Challenge

Old and oversized equipment.

Find cost savings upfront and over the course of time.

Install without disruption of the school's energy needs.

Equipment Highlights

EVO Boilers

EVO Water Heaters

Variable Speed Pumps

TPC Flow Intelligence Control

Results

Lower gas consumption.

Upfront capital savings of $205,000 and $35,000 in energy rebates.

Significant reduction in annual maintenance time.

TPC control for maximum efficiency.

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Solution

Prior to a bid for the Upper School, PEG set-up a TPC Flow Intelligence system for the Upper School that monitored building heat energy usage and provided real-time data of the peak load. This would drive the design of the heating system.

With this knowledge in hand, other companies were asked to bid on the project. The other contractors did not agree with the direction that Lunemann and his colleagues wanted. "They didn't want efficient boilers," he said. "They wanted non-condensing boilers." The results from PEG's analysis convinced them that high efficiency was the way forward.

Thus, seven 630 MBTU/hr. boilers were installed and configured as modules of three boilers and four boilers, with primary/secondary pumping, using three variable speed pumps and a new water heating system (two 300MTU/hr. heaters that incorporates the same technology as the boilers).

A capital savings of $205,000 was captured for DCDS!

"PEG is still continuously working with us to show we are saving. They come in occasionally to download and share data. They didn't just walk away from us. We've still got 100% support."

Success

"They saved us $23,000 a year just in our gas consumption," reported Lunemann. Even better from a labor perspective, "They cut our time as far as annual maintenance goes. It takes a tenth of the time to do maintenance on these boilers versus what we had."

Lowry enthusiastically added, "We can clean the boilers in a day, where before it would take us a week."

Results

The Upper School obtained $31,000 in rebates with the purchase of new boilers, reduced the boiler firing cycles, brought the system efficiency up to 96%, and with the TPC system in place, an exact load profile is always recorded. Not only was gas consumption lowered, but the new pumps allowed for a more frugal use of electricity, furthering the school's savings. The Lower School received $4,000 in rebates and reduced capital costs by over 50%. The system capacity was reduced by 73%, saves 36% in natural gas cost and consumption, and reduced that building's boiler cycling.

The TPC system continues to verify and measure peak load allowing for maximum efficiency and cost savings. On that feature Lunemann said, "The TPC system accumulates a lot of data for how our boilers are operating. It eliminated a lot of our short cycling."

"Yes, we can remotely adjust everything, even shut the pumps off," Lowry remarked. "We can see it anywhere from a laptop. We are able to control the boilers right now. It's a nice piece of equipment."

Lunemann was equally excited. "Yes, and make adjustment changes, temperatures, sub points, outdoor shutdowns, all that good stuff."

Lowry concurred, "This system gives peace of mind, knowing that it's on and functioning."