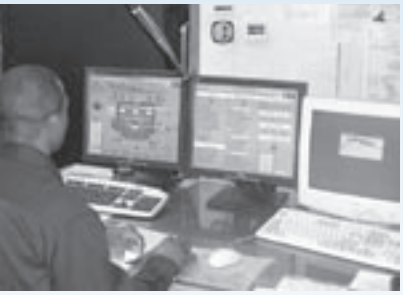
New boiler control systems represent an investment in steam production

Maintaining boiler efficiency means keeping the three Ts — time, temperature and turbulence — finely tuned. It's a job that has required an operator to move constantly from boiler to boiler, checking and adjusting a variety of crucial and often fluctuating factors such as fuel-to-air ratios, fan speeds and water pump activity.



An operator monitors the new computerized control systems.

That's changing.

As part of its multi-year, $22 million capital improvement program, Detroit Thermal recently upgraded the controls on boilers Number 1 and 2. They now are equipped with electronic computerized burner management control systems that allow an operator in a control room to monitor and change many aspects of the steam generation system.

Boilers monitored constantly

"The computerized system allows one person to oversee boiler operations and to keep those operations in synch so that each boiler operates at peak efficiency," said Roosevelt King, manager of steam generating plants for Detroit Thermal. "The computers monitor the boilers constantly and alert us to any factors that might need adjusting."

Each boiler has its own burner management control system, which feeds data to screens in the control room. The screens are monitored 24 hours a day, seven days a week, 365 days a year, by an experienced operator.

"There is always an operator present who has expertise in boiler operations and can switch from automatic to manual operations if necessary," King said.

Systems improve efficiency

One way in which the new burner management control systems contribute to efficiency is by automatically adjusting fuel-to-air ratios as boiler loads are increased or decreased.

"If there's not enough air in the mix, not all the hydrocarbons are burned, so you're not getting all the heat you could from the fuel," King explained. "On the other hand, if there's too much air, it leaves the boiler before it has enough time to absorb all the heat, and that too is wasteful."

The burner management control systems represent major investments in Detroit Thermal's steam generation system.

"In the long run they will help us control fuel costs by ensuring that the boilers run as efficiently as possible," King said. "They are a part of our long-range plan to keep steam a convenient, reliable, affordable energy source in the downtown Detroit area." ■

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The Detroit Thermal VOICE

SPRING 2006

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A grand old boiler yields to its modern successors

In its day, boiler Number 5 was the pride of Beacon Heating Plant.

The 15-story-tall boiler was one of the largest coal-fired boilers in the world. But boiler Number 5's place in history – and in Detroit's district heating operation – has passed and it is being replaced with more efficient boilers, as part of Detroit Thermal's modernization program.

New boilers more efficient

Recently, demolition teams cut apart the huge boiler, and soon, part of a wall of the heating plant will be opened up to allow for the removal of boiler Number 5 and the installation of two smaller boilers.

These new boilers will improve the efficiency of the plant, especially during periods of low demand for steam. They use less fuel when they are "banked" – that is, in a stand-by mode – yet they can reach full load very quickly when necessary.

Cheryl Garrison, Detroit Thermal marketing coordinator, explains changes that are under way at the Beacon Heating Plant to Maggie DeSantis of the Warren/Conner Development Coalition.

Installation begun

At a recent ceremony nearly 150 guests, including representatives of Wayne County and many customers, watched as a symbolic wall came tumbling down to mark the beginning of the installation process. They also toured the plant and attended a reception with Detroit Thermal executives.

"The demolition of boiler Number 5 and the installation of new boilers are key components in our long-term strategy for improving the steam generation system," said Chuck French, Detroit Thermal president and general manager. "We are pleased to be moving forward quickly and glad to be able to share our excitement with our customers." ■

Tamara Harmon (center), of the Wayne County Department of Economic and Neighborhood Development, joins Detroit Thermal executives (from left) Roosevelt King, manager of steam generating plants; Paul Razo, distribution manager; Richard Dilley, controller; Jeff Bees, chief executive officer; and Chuck French, president and general manager, as they mark the beginning of the installation of new boilers.

Meter readers help detect problems

Once a month, usually during the last two business days of the month, Detroit Thermal meter readers visit customer locations to record steam use data that serve as the basis for customers' bills.

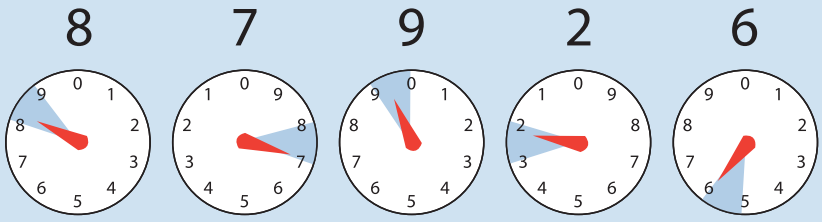
The meter readers are part of the company's customer service team. They are well-trained in the nuances of steam systems and may spot problems even before customers become aware of them.

"Meter readers generally revisit the same customers month after month," said Dave Carman, Detroit Thermal service supervisor. "They get to know what is normal for each building's system and may be able to alert the customer to a problem that needs attention before it develops into a larger, more complex or damaging issue."

Signs of trouble

Since the meter typically is located in an out-of-the-way part of the basement, building maintenance staff may not check the area regularly. They might not be aware of a steam leak or of other signs of trouble such as:

- **Condensate that is excessively hot.** If the condensate is hotter than it should be there is a good possibility that at least some of the steam traps in the building are failing.
- **Steam use data that is abnormally high.** Steam use that is out of line with historical data for the facility may be an indication of a leak somewhere in the system. If the building has a heat exchanger, an unusually high meter reading may indicate a leak in the exchanger that allows water to enter the condensate.
- **Water on the floor.** Water in the area, especially hot water may indicate a steam leak.



Dial style meters look like a series of small clocks. Each dial represents one number of the meter reading.

Two kinds of meters

Detroit Thermal uses steam flow meters to measure steam use on some of the largest customer systems. Steam flow meters are located close to where the Detroit Thermal pipe enters the customer's facility. The meters feature easy-to-read LED digital read outs.

However, most buildings have dial-style meters that look like a series of small clocks with faces numbered from zero through nine. Some of the dials run clockwise, and others run counterclockwise. Each dial represents one number in the meter reading.

"Meter readers are there to do more than record the data," Carman said. "They are also there to help customers find problems before they result in major damage or inconvenience." ■

SAFETY FIRST

When Detroit Thermal meter readers visit a customer location they must have safe, hazard-free access to the steam meter. "It is the customer's responsibility to make sure that the area in which the meter is located is properly maintained," said Dave Carman, Detroit Thermal service supervisor.

The area should be easily accessible. Nothing should be stored in the area or block access to the meter. It should be well lit and dry. ■

Think spring

Facilities that do not use steam for hot water, absorption cooling or processes such as sterilization can take advantage of Detroit Thermal's seasonal shutdown-restart service. A steam service representative will visit the facility to shut down the steam system and read the meter. A representative will return in the fall to turn on the steam and read the meter again.

Customers who sign up for the service are not charged for any steam that may leak through and register on the meter during the shutdown period. Customers who turn the steam off themselves are responsible for all steam that registers on the meter.

The seasonal shutdown-restart service is $120, which includes both spring and fall visits. For more information or to schedule a visit, phone 313.496.1800. ■

Turning old tires into an efficient source of fuel

Most people look at a pile of used auto tires and see a dangerous eyesore. But when Kelly Dodson, marketing manager of Akron Thermal, L.P., sees those discarded tires, he sees lots of British thermal units (Btus) just waiting to be turned into energy to fire the boilers and produce steam.

Akron Thermal, which, like Detroit Thermal is owned by Thermal Ventures II, adds shredded scrap tires to its fuel mix. The clean-burning mixture not only helps reduce costs, it also helps the company reduce its reliance on any single fuel source.

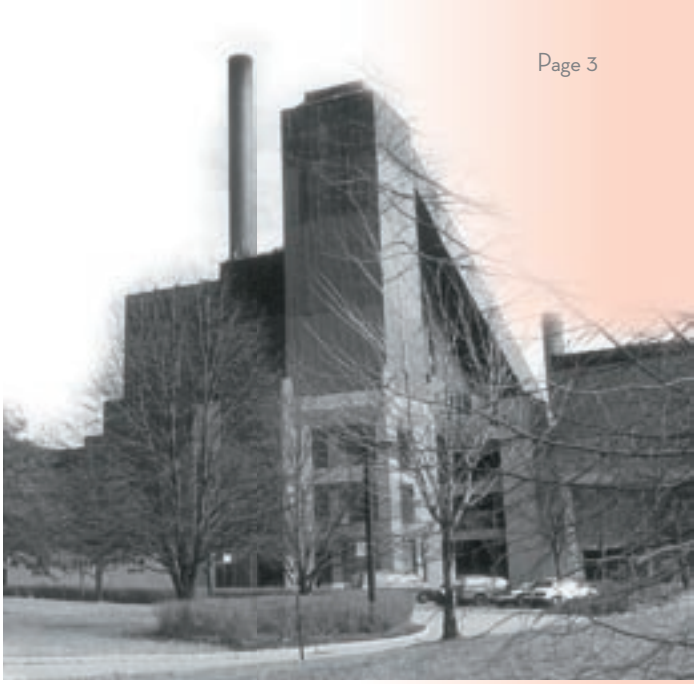
Akron Thermal began adding tire-derived fuel (TDF) to the fuel mix that runs its boilers in 2004. The results have been encouraging. During the first year, the company used about 1,000 tons of TDF per month. The new fuel produces a thousand Btus of heat for about one-tenth the cost of natural gas and has allowed Akron Thermal to reduce significantly the amount of natural gas it uses.

Alternative fuels prove their value

Using TDF is a complicated process that requires new technology and special equipment. The tires must be shredded to one-inch pieces and the bead wire removed. Then the TDF must be mixed at exact ratios with other fuels such as waste wood or coal before it is delivered to the boilers. However, Akron Thermal's experience proves the potential for TDF.

"Volatility and price increases in the natural gas market make it important for us to explore the possibility of alternative fuels," said Mark Butta, vice president of business development for Thermal Ventures II. "In Detroit we already use steam produced by burning municipal waste at the Greater Detroit Resource Recovery Authority facility. Other alternative fuels may offer other opportunities."

Dollar savings and energy independence are just two of the advantages of TDF. Since the material in tires is a petroleum byproduct, it has an energy value nearly equal to that of oil. TDF produces 13,000 to 15,000 Btus per pound and has a low sulfur content. It burns cleaner than coal.



This Akron Thermal plant adds tire-derived fuel to its fuel mix.

Community also benefits

The use of TDF also helps reduce tire stockpiles, which are often breeding grounds for mosquitoes and other pests, and it keeps discarded tires out of landfills. Akron Thermal estimates that it used about one million tires during its first year of operation with TDF.

"In Akron we find that mixing TDF with coal or waste wood produces a fuel that is readily available, clean-burning and less expensive," Butta said. "At the same time, it helps the community solve the problem of what to do with old tires, which present both a health hazard and an environmental problem."

Energy diversification has taken on new importance since President Bush mentioned it during his State of the Union message. Michigan Governor Jennifer Granholm, in her State of the State address, called on Michigan to be the "alternative energy epicenter of America."

"Tire-derived fuel is proving to be a win-win situation in Akron," Dodson said. "It's good for us, for our customers and for our community." ■

SUPER BOWL PARTY AIDS CHARITIES

Super Bowl XL was more than football and fun. It was an opportunity to help local charities through the Motor City Touchdown party. Detroit Thermal was one of the sponsors of the event, which attracted more than 1,500 people to the hangar at Coleman A. Young Municipal Airport (City Airport) for an evening that featured decorations, music and foods unique to Detroit.

"Detroit Thermal was glad to be a sponsor of Motor City Touchdown, which was one of the events sanctioned by the Detroit Super Bowl XL Host Committee," said Cheryl Garrison, Detroit Thermal marketing coordinator. Garrison represented the company on the Motor City Touchdown Planning Committee.

"It was a way of being part of the Super Bowl excitement and helping our community at the same time," Garrison said.

Motor City Touchdown raised more than $130,000 for the benefit of local charities including Communities in Schools Detroit, Habitat for Humanity-Detroit, the Warren/Conner Development Coalition and the Tuskegee Airmen Museum. ■