



Metro Nashville DISTRICT ENERGY SYSTEM

A PUBLICATION OF METRO NASHVILLE DISTRICT ENERGY SYSTEM

Fall 2008

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Fifth Annual Golf Tournament

The Fifth Annual Constellation Energy/Nashville District Energy System Golf Tournament was recently held at Pine Creek Golf Course in Mt. Juliet, Tennessee. The golf course was in excellent shape again this year, and as always, the staff was a pleasure to work with. Out of the 64 people who played, 14 were Constellation Energy Projects & Services or District Energy System employees, five were customers, and the remainder consisted of contractors, vendors and friends.



First-place team members: (l to r) Scott Carroll (Power and Generator Testing, Inc.), Linda and Ronnie Moore (Southern Field Maintenance & Fabrication), and Jimmy Hatcher (Constellation Energy/Nashville District Energy, LLC)

The teams were evenly matched. The winning team finished with an 11-under-par 61, and the last-place team finished at even-par 72. Many of our customers, contractors, vendors and friends generously

General Manager's Corner

By *Tim Hestle*

Recently, I have used analogies to golf and stock car racing when explaining how things work in the Nashville District Energy System. In this issue, the featured building is the Shermerhorn Symphony Center and the Employee Spotlight is on Ray Stepp, whose wife is an accomplished song writer. Since the theme of this newsletter seems to be music related, I am going to attempt to use a music analogy. Be forewarned, this will be somewhat of a stretch for me since the only instrument I can play is the radio. In politically correct terminology, I am musically challenged.



As we approach our five-year anniversary, it is interesting to see how things have evolved at District Energy System (DES). Like the sections of an orchestra, there are many players required to make sure DES continues to perform at a high level.

Most entertainers and bands have a **promoter** to sell and book performances. As the owner of DES, Nashville's Metropolitan Government fills this role through customer contracts and its effort to sell the system's unused capacity. Metro's contract administrator, Thermal Engineering Group, acts as a **manager** to make sure Metro's DES' contractor performs as billed. The **composer** of DES is Metro's contractor, Constellation Energy Projects & Services Group (CEPS). The system's music has been arranged through a 15-year initial contract, and CEPS' local management team acts as the conductor, making sure each component of the arrangement is performed as written.

Every first-class orchestra needs a good **support staff**. It needs someone to make sure the concert hall is set up correctly, and to ensure that everyone has a chair. Additionally, each band member needs to be sure he or she has a working instrument. If they need extra strings, bows or reeds, someone has to supply them. Our vendors and suppliers fill this roll for DES. They furnish what we need to keep our equipment in the highest working order.

As I mentioned, an orchestra is made up of several sections, each containing several musicians. Similarly, DES' contractor utilizes subcontractors and internal departments, with several employees in each, to operate the system. In the same way trombones, clarinets, saxophones, trumpets and flutes make up a **horn section**, a variety of subcontractors fill this role for DES. They include everything from mechanical contractors to chiller and chemical vendors to environmental and safety engineers. CEPS' operations employees make up the **string section**. It is their job to keep the plant and distribution system running in tune. CEPS' maintenance personnel are the **percussionists**. It is their job to make sure that all equipment is maintained at a high level, so the steam and chilled water systems do not miss a beat. Our **audience**, the DES customers, can attest that we have accomplished this for the past five years. Since no one is perfect, there is bound to be an occasional sour note when someone is off key. In spite of this, we are very proud of our record for delivering safe, efficient, dependable service, which has been more than 99 percent.

sponsored holes and donated gifts to be given away as prizes. Constellation Energy Projects & Services Group sponsored a hole-in-one contest on all of the par-3 holes and the barbecue luncheon immediately following the tournament. The event was a tremendous success, and everyone who participated had a great time.

Individual contest winners:



Doug Entz
(Buckman
Chemical)
Drive on #18



Linda Moore
(Southern Field
Maintenance)
Longest Closest-
to-the-Pin on #6

Customer Spotlight: Schermehorn Symphony Center

The neoclassical Schermehorn Symphony Center, located in downtown Nashville, is home to the critically acclaimed Nashville Symphony. Maestro Kenneth Schermehorn was the music director and conductor of the Grammy Award-winning orchestra for 22 years. The center was named in his honor, before his death in 2005.

The world-class Laura Turner Concert Hall is housed in this building, which encompasses a full city block. The shoebox design was inspired by some of the world's great concert halls, many of which were built in Europe in the late 19th century. Construction began in December 2003, and in less than three years the doors opened to the public for its first concert on September 9, 2006.

Since Nashville is known as Music City, the building was designed to accommodate a variety of musical genres, including classical, pops, cabaret, choral, jazz and blues. An automated system of moveable

In comparison, the Nashville Symphony has won numerous awards, including a Grammy. DES has also won several awards, including System of the Year. As we move forward, we intend to continue doing our part to ensure everything associated with DES stays in harmony.

Metro District Energy Systems Celebrates Five Years

To celebrate Metro DES' accomplishments over the past five years, and to say thank you to our valued customers, we are hosting a customer appreciation event on Friday, Jan. 16, at 10 a.m., at the District Energy Systems facility. The event will feature remarks by Mayor Karl Dean, light hors d'oeuvres and a tour of the facility.

Since 2003, DES has been responsible for providing heating and cooling to more than 40 downtown buildings with a reliability rating of more than 99 percent. Metro District Energy Systems will officially commemorate five years of service to customers in downtown Nashville on Dec. 16.

Please save the date and plan on joining us as we celebrate five years of successful service.

Many readers probably are aware of the important role DES plays in the city's infrastructure, but here are a few points that DES is especially proud of:

- Metro DES has a proven track record of being a greener, more efficient and more sustainable source of heating and cooling than in-house heating and cooling systems.
- District Energy Systems' heating and cooling services improve the community's carbon footprint by helping to reduce CO₂ production by approximately 46,600 tons per year.
- DES provides its customers with one of the nation's lowest chilled-water costs of service.
- Metro DES consistently maintains a reliability rating of more than 99 percent, and because Metro has budgeted for capital projects, DES can ensure a high reliability rating for years to come.

Customers' variable costs have steadily decreased over the past several months.

Music City Center Closer To Becoming a Reality

One of the most exciting projects that has moved forward under Mayor Karl Dean's administration - with support from the Metro Council and leadership from the Metropolitan Development and Housing Agency - is the planning and design of a new state-of-the-art downtown convention center - the Music City Center. Nashville has been studying the idea of building a new downtown convention center since 1999, and has recently begun putting a plan into action to make it a reality.

The site for a new convention center has been selected, and the process is under way to create a master plan for the area around the center, determining the size and design of the new center and its projected costs. With the Council's approval, the new convention center will be located between Fifth and Eighth Avenues South, on the south side of Demonbreun, only a few blocks away from the DES plant. Construction is set to begin once funding has been authorized by the Metro Council.

Metro DES is very supportive of the city's efforts to build a new downtown convention center, and our leaders have been in contact with MDHA officials regarding the possibility of heating and cooling the facility. As a result of the city's decision to install additional future capacity, DES has been able to service new downtown

banners and panels, located around the hall, can adjust the acoustics for various types of performances.

One of the most innovative features of the Schermerhorn Symphony Center is a convertible seating system. The orchestra-level seating of the concert hall can be transformed from rows of comfortable theater seating to a 5,700-square-foot hardwood ballroom floor, typically used for cabaret-style events such as pops and jazz concerts. A unique motorized chair-wagon system lowers rows of seats into a special storage space below the surface of the ballroom floor. This convertible system gives the concert hall great flexibility for numerous types of events throughout the year.

The building is also available for use by children, parents and teachers to promote music education and music appreciation. Other attributes include a public garden and cafe, enclosed by a colonnade, on the west side of the building. The colonnade, across Fourth Avenue South from the Country Music Hall of Fame, is open to the public throughout the day and during concerts.

Along with its many other innovations, this building is heated and cooled by the Nashville District Energy System.

Employee Spotlight: Maintenance Supervisor Ray Stepp



Wyman R. "Ray" Stepp is the maintenance supervisor for the Nashville District Energy System. He has been a Constellation Energy Projects & Services employee since December 2003, when the transition was made from the old thermal plant to the new energy generation facility. Stepp was first hired as a mechanic, the same position he had held at the Nashville Thermal Transfer Corporation. In 2006, he was promoted to supervisor.

developments, and would have the resources to support a new convention center without any adjustments for current customers.

We will keep readers up-to-date in future newsletters regarding the progress of the new convention center. To learn more about the Music City Center, please visit www.nashvillemusiccitycenter.com.

Tips for Customer Energy Savings

As you prepare your buildings for the approaching heating season, we would like to take this opportunity to present to you a few suggestions on saving energy this winter. Energy conservation is beneficial for everyone. In addition to saving you money, energy conservation reduces the consumption of hydrocarbon-based fuels, and reduces the amount of greenhouse gas emissions. We hope the following list proves helpful to you this heating season.

Faulty steam traps - Steam traps are located in everyone's building and throughout the DES. They are used to separate the moisture condensed in the steam pipes from the steam. Typically, the outlets of all of the steam traps are piped to a condensate receiver where the condensate is collected and pumped back through the EDS (Energy Distribution System) to the EGF (Energy Generating Facility; central plant). When steam traps fail, they will often allow steam to pass through the orifice and into the condensate piping. Occasionally, a failed steam trap will leak steam from its bonnet or connection points into the mechanical room. Evidence of faulty steam traps includes steam leaks at the traps themselves, or excessive steaming from the condensate receiver (some steaming due to the evaporation of the condensate can be expected). A single faulty trap could cause a loss in steam flow rate of approximately 50 pounds per hour - steam that you bought but from which you received no benefit. This flow rate could cost as much as \$600 per month per defective trap! Each piece of equipment receiving steam requires a steam trap. Therefore, having 10 to 20 traps within your building is a real possibility. Inspect your steam traps regularly and make sure they are all functioning properly.

Steam leaks - Steam leaks are easy to spot, but they can be even more costly than faulty traps. Steam leaks typically occur at flanges and threaded connections due to a loose connection, damaged gaskets or a damaged section of pipe. Steam leaks can be very dangerous, and may cause property damage if left unchecked. A small steam leak, especially in a high-pressure line, will soon become a large steam leak as the high-velocity steam erodes an even greater hole in the pipe, fitting or flange. A one-eighth-inch-diameter hole can begin leaking at a rate of approximately 25 pounds per hour. Although the cost of the lost steam may be only around \$300 per month at this rate, this flow rate will not last long! The hole will become larger and costs will mount with an increased steam loss and increased damage to the pipe, fitting, valve or flange that you will eventually have to replace. Inspect your piping regularly, and repair any steam leaks as soon as possible.

Missing or damaged insulation - The insulation on your steam piping, valves, fittings, tanks and equipment decreases the heat loss from the device. You may not consider the insulation very important, but it is! The heat loss from steam piping to the room causes some of the steam in the pipe to condense. This condensed moisture is removed from the piping via the steam traps, thus this condensate is steam that you bought, but that left your heating system before it did any heating. You will have to replace every pound of steam that condenses with another pound of steam, thus increasing your heating costs. In addition, exposed hot surfaces caused by a lack of insulation can create a hazard for your personnel. The surface of a bare section of high-pressure steam pipe can be more than 250° F. Some heat loss will always occur in your steam piping, but you can minimize those losses by maintaining your insulation or insulate pipe or equipment that has not traditionally been insulated.

Stepp's duties include making sure preventive maintenance is scheduled and performed on all equipment in the plant, as well as on all equipment in the energy distribution system manholes and tunnels. He is also responsible for repairing equipment, for parts and tools inventory, and for managing a staff of five mechanics.

When asked about the biggest challenge his job presents, Stepp said, "The plant equipment has been relatively easy to maintain because it is still pretty new. Keeping up with the Energy Distribution System (EDS) has been more challenging because of the logistics and the age of the valves and traps and piping. The good news is that we have had more time to devote to the EDS because we haven't been preoccupied with making repairs in the plant. The plant equipment is only five years old, but as it ages we expect things to start showing wear. That's why we're trying to keep everything in as-close-to-new condition as possible."

Stepp is married and has two sons. His wife of 17 years, Debi, is an accomplished songwriter and has had several songs recorded by major recording artists. His younger son, James, is an avid golfer and plays for his high school golf team. His older son, Chris, is the caretaker of a farm in Florida.

When he is not working, Stepp enjoys spending time camping, canoeing, watching sports and golfing with his family and friends. His co-workers try not to hold it against him, but he is also a big Florida Gators fan.

Controls and control valves - Control valves stick. Pilots fail on pressure regulators. Linkages break. But you knew that already, didn't you? You should regularly inspect your control valves at your coils or heat exchangers to make sure they are stroking properly. You may also want to inspect your dampers, especially if you have an economizer cycle on any of your air handlers, to make certain that they are opening and closing when they are supposed to - and only then. Stuck valves and dampers can be a hindrance to your operation but may also be a source of energy loss.

Outside air dampers that are stuck open will greatly increase the steam required at a coil on a cold day. Similarly, control valves that are stuck open allow steam to pass through your coils uncontrollably. These energy losses are difficult to quantify and vary between units, but they can be costly. Your control system (EMS) can also be a source of energy loss if your thermostat settings are not correct or are not responding properly. You may also want to make sure that your controls for cooling are working properly at the proper set points. It is not unusual for some buildings to have high chilled-water usage during the winter months due to stuck valves or improper set points.

Humidity control and chilled water - When you inspect your steam or hot water valves at your coils you should also inspect your chilled water valves. It is common for buildings to have humidity control on their coils to maintain a steady level of humidity year-round. You may want to review the operation of your humidity controls to make certain they are not causing an increase in chilled-water usage during the heating season. We have seen some buildings with both high steam and chilled-water usage during the winter months due to faulty humidity control or chilled-water control valves. The last thing you want to do is to pay for steam that you're using to heat the air that you just cooled with the chilled water that you just bought. Under this scenario, you will end up paying twice for the energy - once for the chilled water to cool the air and second for the steam to heat it back up.

Fan belts - Most fan coil units and air handlers have belt-driven fans. Fan belts become frayed or stretched over time, causing slippage between the motor and fan pulleys. This slippage can result in a reduced fan speed, which will reduce the volume of air flowing through the fan. When this begins to occur, you may begin to notice that your air-side temperatures are becoming too hot or too cold, and you may begin to lose control over the air temperature completely. With damaged or broken fan belts, the motor drives continue to use electricity but will result in less air flow, thus the efficiency of your operation begins to decline. Regularly check your fan belts and replace broken or damaged belts to keep your system working properly.

Air filters - Air filters, as we all know, should be checked and replaced regularly. As they become clogged, they develop restrictions in the air-side flows across your coils. These restrictions may cause an increase in the electrical energy required by your fan. You may also begin to experience a loss of control of the air-side temperatures. In addition, with dirty or missing filters, dirt and debris may find their way to the face of your coils. With dirty coils, the air-side flow rate will become restricted; but you may also experience a decrease in heat transfer, thus causing a loss of air-side temperature control. Cleaning your coils can be expensive, so it is important to check your air filters regularly and replace them as necessary.

Water chemistry for closed-loop hot water systems - If your building operates with a closed-loop hot water system, you may be familiar with the issues surrounding water chemistry. The hot water you have circulating throughout your building can cause corrosion to coils and piping, but the main problem is the formation of deposits on your coils due to poor water treatment of the city water makeup. These deposits can cause a substantial decrease in the ability to transfer heat in your steam-to-hot water heat exchangers, and in your heating coils at your air-handler and fan-coil units. These problems can cause an increase in steam flow to heat the same amount of hot water flow due to an inability to achieve your air temperature set point. You may also begin to be unable to meet previous air temperature set points due to the

restrictions on heat transfer. In addition, you may begin to require more pumping energy to circulate enough hot water through your coils to heat the air to the temperature you need. Never underestimate water chemistry; it is very, very important!

Staging equipment - Although not necessarily a source of energy loss, opening valves quickly or starting many pieces of equipment at once can cause a momentary jump in your steam or chilled-water demand. These spikes in demand can cause your monthly demand to exceed your contract demand. When this occurs, your demand could be adjusted to a higher value (based on the magnitude of the demand excursion) for the next 12 months. Opening valves quickly, especially main steam valves, has a tendency to allow a tremendous amount of steam to pass - especially if your building is cold and all your control valves are open. You can potentially avoid a demand adjustment by staging your air-handlers, fan coils and pumps over the course of 30 minutes to one hour. In addition, never, ever open your main steam valve, or any valve, quickly. Slowly open your valves, either manually or with your control valves, to result in a slow warming of your system over the course of at least one hour, if not longer.

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