Citizens Thermal Update

A Division of Citizens Gas & Coke Utility

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Citizens Thermal's rates among lowest in the Midwest

Buildings and industries in the Downtown Indianapolis area are receiving among the lowest-priced steam energy services in the Midwest, according to a study conducted by Citizens Thermal Energy, a division of Citizens Gas & Coke Utility.

Compared to nine Midwestern cities including Detroit, Cleveland and Kansas City, the steam energy rates of Citizens Thermal ranked second lowest for small steam users and third lowest for large users. On average, Citizens Thermal customers pay approximately 22 percent less for steam in Indianapolis compared to the average steam price charged in the nine Midwestern cities.

Citizens Thermal operates one of the nation's largest district steam heating and cooling systems. The company produces steam at its Perry K Steam Plant located Downtown across from Victory Field. Steam from this plant provides heat and hot water to more than 200 buildings and industries in the Downtown Indianapolis area. Citizens Thermal also operates two chilled water plants that provide air conditioning and chilled water to more than 60 buildings in the Downtown area. Anchor customers of Citizens Thermal include the RCA Dome & Convention Center, Eli Lilly, General Motors and the growing campus of Indiana University-Purdue University Indianapolis.

Holding down costs is an ongoing process at Citizens Thermal, according to Bill Tracy, Vice President of Citizens Thermal Business Development. "We are continually looking at our processes and rates to benchmark our system with other comparable systems in an effort to hold down costs while improving customer service. We know reasonably-priced steam energy is vital to the ongoing growth and development of Indianapolis," Tracy commented.

Tracy added that use of multiple fuels to produce steam is among the most important factors in keeping rates low. "The flexibility of our boilers to use coke oven gas, coal, natural gas, and fuel oil is very effective at controlling the cost of steam for our customers. We also obtain competitively-priced steam from Covanta Energy that is generated by boilers that burn refuse. By closely monitoring the cost of these fuels, we are able to choose the most cost-effective fuel option for our customers," Tracy explained.

Energy services from Citizens Thermal also provide important long-term advantages to customers. "The services provided by Citizens Thermal enable businesses, industries, educational institutions and health care facilities to focus their resources on their particular missions, rather than on operating and maintaining energy facilities," Tracy said.

Maintaining Steam Traps

Most plant and facilities professionals with steam systems in their care have asked questions including the following: What are the signs of a malfunctioning steam trap? How often should traps be inspected? What inspection techniques are available? What testing instruments should we use? How do we start a steam trap maintenance program? What kind of training resources are required?

Steam trap basics

Basically all steam traps have the same functions. They allow condensate and non-condensable gases to escape while holding steam in a device where a thermal or heat transfer process occurs. A regulator controls the input side of the process and the steam, after releasing energy to the process, condenses and reverts back to its liquid state. The purpose of the steam trap is to retain steam in the heating element and to release the non-condensable gases and condensate. The principal design consideration is to balance the condensing rate and the import rate of the control device on the input side with the exiting condensate.

Ultrasonic detectors translate ultrasonic emissions into sounds the human ear can hear, allowing technicians to detect failing steam traps before they fail completely.

Stephen Banyacski president of Nicholson Steam traps (Walden, NY) emphasizes the need to choose the appropriate steam trap. “Properly sized traps relieve the condensate, react quickly to changes in load, and trap the steam while allowing air and other non-condensable gases to escape,” he says.

Finding malfunctioning traps

As with any mechanical device, a steam trap can malfunction. “If the steam trap fails closed,” the device that should be draining will flood and the heat transfer process will stop, and whatever product is being produced ... will no longer be up to the required quality standards. If the trap fails open, there will be a waste of energy, steam will not be completely consumed or condensed in the exchanger and steam will blow through.” Banyacski notes that a plume of steam escaping from the condensate receiver or from some part of the condensate return system signals such a condition.

He adds that it is difficult to determine whether a steam trap has failed just partially open, indicating a slow leak and a developing failure. “Such a ... failure could persist for quite some time without any outward sign. Therefore, a maintenance person should make periodic surveys of the installed base of steam traps. Banyacski emphasizes that steam blowing through a trap indicates that the trap needs to be repaired or replaced.

> ***Failed steam traps waste and adversely affect product quality. Therefore, a maintenance program for steam traps is a good investment.***
>
> *Gary W. Mohr, UE Systems, Inc*

inspection methods

Oftentimes, a misapplied steam trap (too small, the wrong design) will malfunction. Ultrasonics, infrared temperature measurements and visual inspection have proven useful to maintenance personnel in checking for malfunctioning steam traps. Of the three, ultrasound is the most reliable. Visual inspection requires an inspector to let a steam trap discharge to atmosphere. However, doing that changes the parameters of the closed system and, therefore, can be unreliable.

There are enough variables in the system - back pressure, for example - so that temperature is not the most reliable indicator either. Portable infrared thermometers provide close estimations of pressures on valves, traps, and coil heaters. These devices are also useful for spotting conditions such as heat loss, the need for insulation, overheating, overloads, and cooling failures. Thus, an infrared thermometer be used along with ultrasound.

Traps that have failed completely open are easy to detect, but the object is to find failing traps before they fail completely. Ultrasonic testing can do that. In essence, using an ultrasonic instrument is like putting the inspector inside the steam trap and piping system allowing him to detect a leaking steam trap. Ultrasonic detectors translate ultrasonic emissions ... into sounds the human ear can hear.

Technicians who use ultrasonic detectors on a daily basis can achieve accuracy that exceeds 98%. And regarding frequency of inspections, process components of equipment, as well as drip main stream traps should be checked twice a year. Heating steam traps (in facilities that use steam for space heating) should be tested annually and instituting a reporting system to keep tabs on the location, type, size, capacity and condition of all traps in a steam system is imperative.

Heating Degree Day and Cooling Degree Days

What do they mean?

Outside ambient air temperature is one of a few variables that affect energy usage. The "degree day" is used to assist utility companies, heating, ventilating and air conditioning companies express the demand for heating or cooling created by the weather over a period of time. Degree-days are also useful for estimating the heating and cooling requirements and fuel costs for a building. The concept originated with the observation that demand for natural gas for heating does not pick up until the average daily temperature falls below 65F.

Therefore, degree-days are measured as a deviation from 65F, the base temperature. To calculate degree-days, you average the highest and lowest temperature for a day (24-hour period). The result, subtracted from 65F, is the number of degree-days for that day. Positive values are expressed as heating degree-days; Negative values as cooling degree-days. Each degree counts as one-degree day.

Example #1: if today's high temperature is 60F and the low is 30F our average daily temperature is 45F. Subtract 45F from 65F and we get a positive 20F. This means we have 20 heating degree-days for the day.

Example #2: if today's high temperature is 90F and the low is 60F our average daily temperature is 75F. Subtract 75F from 65F and we get a negative 10F. This means we have 10 cooling degree-days for the day.

Adding all degree-days each day represents the total number of degree-days per year. According to the Indianapolis National Weather Service Center, for Indianapolis the normal number of heating degree-days per year is 5,521 and the normal number of

The Demand Ratchet

Isn't that a tool I use to work on my car?

Well, for some of you it may be, but for Citizens Thermal Energy it is an agreed upon methodology with the Indiana Utility Regulatory Commission to levelize the demand component of our Rate 2 customer's bill over the year. To be eligible for Rate 2, a customer must have a minimum billing demand of 50 Therms per hour. (A Therm is a unit of heat equal to 100,000 British thermal units.)

The Demand Ratchet is typically engaged during the summer months when a customer's demand for steam is the lowest. Most customers who are served with steam use it for heating and typically have their peak usage take place in the winter months and their lowest usage in the summer months.

The Demand Ratchet simply helps to eliminate the high variability in a customer's bill by levelizing the demand cost component of the bill across the year. This is somewhat similar to "budget billing."

Here's how it works. The Demand component of a customer's bill cannot be less than seventy-five percent (75%) of the maximum thirty-minute Demand during the proceeding eleven (11) months. So, a simple comparison is made between the "ratcheted" maximum demand (maximum demand multiplied by 75%) and the current months peak demand. The higher value between the two is then used to calculate the customer's bill.

So, let's say a customer had a peak earlier this year in the winter month of February of 1,000 Therms per hour. This peak gets "ratcheted" or multiplied by seventy-five percent 75% to arrive at a product of 750 Therms. 750 Therms will now be compared to each of the next 11 months' peaks until a new peak is set. The higher of the "ratcheted" peak, 750 Therms, and each of the actual month's peak for the next 11 months will be used to calculate the demand component of the customer's bill for that month.

Example: Again, in February our customer peaked at 1,000 Therms. It is now summer and the same customer's peak for the month of August is 500 Therms. A comparison is made to the ratcheted peak for the month of February, 750 Therms, and the actual peak for the month of August, 500 Therms. The higher of the two is the ratcheted peak, so 750 Therms will be used to calculate the customer's peak.

Steam Luncheon

On August 12th and 13th, 2003 Citizens Thermal Energy hosted luncheons for our steam customers at the Omni Hotel in downtown Indianapolis. The event featured a terrific lunch followed by short presentations on steam related topics. The luncheon concluded with the opportunity to tour the Perry K Steam Plant. This year the steam topics included steam system maintenance suggestions and a discussion of fuel and environmental issues that affect the price of steam.

Citizens Thermal Energy typically hosts an informational breakfast in the spring for the chilled water customers and a luncheon in the summer for the steam customers. We would like to encourage all our customers to take advantage of these opportunities. It is a chance to learn more about steam and chilled water issues, and at the same time let the Citizens Thermal Energy staff get to know you. It provides a wonderful opportunity for our customers to give us feedback on areas that are working well or perhaps need improvement. We also would like to thank those customers that participated in this year's programs.

Employee Spotlight

Paul Nienaber is currently working for Citizens Thermal Energy at our West Street Plant as a Chilled Water Operator. He has been with Citizens Thermal Energy since the transition from MAER in 2000. His current responsibilities include operating chillers, cleaning, painting, upkeep, and other various duties as assigned. He also supports the ICE plant when needed. Paul is now actively working with the group performing tower cleaning.

Paul has a 6-year old son name Jordan, who he truly adores. Paul has a fun-loving sense of humor.

Steam and Chilled Water Service Telephone Numbers

Dave Toombs,
Thermal General Manager,
317-927-4356 (office)
317-727-1342 (cell)
Jamie Dillard,
Assistant General Manager
317-927-4360 (office)
Sharon Connell,
Customer Service & Billing Representative
317-261-8794

Toll Free Number - Customer Service & Billing
877-313-2467
Jeff Hansen, Manager
Customer Services and Distribution
317-693-8704 (office)
317-695-2019 (cell)
Bob Purdue,
Plant Manager (Steam Operations)
317-693-8701 (office)
317-695-0512 (cell)
Bob Taber, Foreman,
Customer Service & Metering
317-693-8883 (office)
317-695-7924 (cell)
Jim Teso, Facilities Manager (Chilled Water Operations)
317-236-6702 (office)
317-695-0145 (cell)

Other telephone numbers: Marketing - Steam and Chilled Water

Bill Tracy, Vice President, Market Development
317-927-4534 (office)
Jeff Harrison, Director, Market Development
317-927-4791 (office)
Lane Dunagin,
Industrial Sales Consultant
317-927-4347 (office)
317-694-2776 (cell)

Steam and Chilled Water Service Emergency Contacts
In the event of a steam or chilled water emergency, Citizens Thermal Energy can be reached at the following numbers:

Steam Plant Operations Emergency 24-Hour Number (Steam Operations Control Room)
317-261-8804
Shift Supervisor's Office
317-261-8819
Ron Pinkins, Operations Supervisor
317-261-8807 (office)
317-431-4414 (cell)
Chilled Water Plant Operations Emergency 24-Hour Number (Chilled Water Control Room)

317-236-6700