Outsourcing in Omaha: District Heating and Cooling Play Vital Role

Demand-side Management Leads to Significant Savings

Heat Exchanger Application Highlights Safety and Convenience

Non-regulated Energy Business Expanding Worldwide

and more...
Outsourcing Heating and Cooling:
Across the country, it's the wave of the future. In Omaha, it's the wave of the past.

By Judith Martz Studt, President, Studt Communications, Inc.

With an eye on cutting costs and improving operating efficiency, more and more corporations and institutions across the nation are outsourcing their heating and cooling, turning to professional energy managers who make a living operating high-capacity steam and chilled-water production equipment.

But in downtown Omaha, companies and other organizations have been outsourcing for years . . . some as early as the 1920s. Yet it wasn't until 1968, nearly half a century later, that a concerted effort was made to offer combined heating and cooling service. That was when Energy Systems Company (ESC) — one of the first companies in the United States to offer commercially available chilled water — got started.

"We've been going strong ever since," Dave Woods general manager of ESC says. "In fact, we just signed a contract with the General Services Administration to heat and cool two federal buildings here."

Woods was an electrician when the fledgling company was just getting off the ground. He recalls that the small business venture was the brainchild of a group of prominent business owners who were committed to revitalizing Omaha's central business district.

But the firm that actually put up the seed money for Energy Systems was Woods' employer — Northern Natural Gas Company, which later became part of Enron Corp. It was Northern that hired a nationally recognized local architectural firm — Leo A. Daly Company — to design ESC's multimillion-dollar energy plant and distribution system.

"Initially we had just three customers."
"Initially," Woods explains, "we had just three customers — Northern Natural Gas, Northwestern Bell and Woodmen of the World, whose headquarters were all in Omaha. But gradually, we expanded our underground pipeline, connecting our facilities to an old steam plant that had provided heating for 17 other buildings."

Energy Systems then hooked up its system to police and Union Pacific headquarters, a department store that heated five other structures, the YMCA and Creighton University — a major Catholic institution that had 20 buildings, including two new hospitals, to heat and cool.

Over the next decade and a half, ESC added a 911 center, museums, churches, office buildings, hotels, apartments, banks, government buildings and a public library. During that time, the company became a privately held Nebraska corporation and recognized the need to upgrade equipment for reliability and customer service. As a result, it spent several million dollars, including over $300,000 for an emergency generator.

By the end of 1993, the company had more than 22,000 feet of underground pipeline, zig-zagging like a maze throughout Omaha's downtown business district and connecting to over 80 percent of the properties there.

Today — after more than 26 years or a quarter-million hours of around-the-clock service — Energy Systems continues to do a booming business. The company now serves over 50,000 people who work in 90 buildings in a two-square-mile area. Collectively, the firm's 60 customers have over 11.6 million square feet of space, and consumed 30 million ton hours of chilled water and 560 million pounds of steam last year.

"We have come a long way," Woods says. "But we still have a long way to go. We're expanding and picking up new customers all the time."

In short, outsourcing isn't just a wave of the past. It's a wave of the future — both in Omaha and many other major cities. (For a closer look at some of ESC's clientele, see the accompanying stories.)
‘It was a property manager’s nightmare.’

John Waldbaum, executive vice president of Pacific Realty Group Inc., still has some vivid memories of that hot summer day, and they all involve unhappy tenants. “When something like this happens,” he says, “people never forget.”

It was June 1990, and Waldbaum’s company had just taken over management of its seventh building in downtown Omaha — the one that housed its own headquarters. During the night, the building’s 300-ton, R-11 chiller motor had failed. The following morning, both temperatures and temps were rising.

“It was a property manager’s nightmare,” he recalls, “...95 degrees outside, 117 degrees inside and no air circulation. People were wearing tank tops and shorts, feeling miserable.”

To make matters worse, the motor couldn’t be repaired. A new one had to be ordered and wouldn’t arrive for two weeks. “We didn’t have any cooling for two full days,” Waldbaum adds. “Finally, we located four temporary chilling units and placed them in the stairways so the cool air would blow into the largest tenant offices.

“I swore I’d never let this happen again. The minute I had a free moment, I called Dave Woods at Energy Systems (ESC).”

Waldbaum and Woods had worked together on other building projects. All but one of Pacific Realty’s downtown buildings were already on ESC’s community system. "I knew we could rely on the company to give us good, dependable service," reflects Waldbaum.

Waldbaum says the initial plan was to use ESC’s cooling system as a back-up and on days when “we needed quick cooling and didn’t want to waste money turning on our own chillers.” But eventually, Waldbaum switched to Energy Systems on a more regular basis.

There are a lot of advantages to outsourcing, he stresses. “For example, it’s very efficient and fairly inexpensive; minimal maintenance is required. Also, we have reduced our investment and don’t have to factor in depreciation any longer.

Continued on page 16
Energy Systems’ customers are our most valuable asset. We appreciate the business they have given us over the last **25 years**. We look forward to providing them top quality services for many, many years to come.

**THANK YOU!**

Energy Systems has been providing steam and chilled water service for the heating and cooling to:

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**ESC Energy Systems Company**

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Outsourcing Heating and Cooling
Continued from page 14

"In addition," Waldbaum continues, "we're able to do a better job forecasting our budgets for the following year because ESC's computers automatically track our usage."

But by far the biggest advantage is "that sense of security you can't get anywhere else," he says. "It means you can avoid most heating and cooling problems that make for an unhappy tenant."

Boys Town National Research Hospital has been outsourcing for as long as it has been in business.

Boys Town National Research Hospital — a division of Boys Town that specializes in treating children with hearing and speech problems — has never had to worry about chillers and boilers. That's because the building doesn't have any.

"We never got them, and it's a good thing we didn't," David Brintnall, contract administrator of the hospital, says. "Space is such a premium here, I don't know where we'd put the equipment."

Brintnall explains that the 180,000-square-foot facility was designed in the mid '70s by the same architectural firm that drew up plans for Energy Systems Company's (ESC) power plant. Originally, the hospital received its heating and cooling from nearby Creighton University. But when Creighton switched to ESC in the late seventies, Boys Town did, too, and has been on the system ever since.

That's just fine with Brintnall. "By outsourcing, we haven't had to purchase equipment, or worry about maintenance costs or a full-time staff. In effect, we have been able to keep our costs down and concentrate on running a first-class, nationally recognized institution."

Unlike most medical centers, Boys Town National Research Hospital doesn't have many beds — most surgery and other procedures are done on an out-patient basis. Still, the need for constant temperature control is just as great here as it is at other institutions.

"That's another advantage of being on ESC's system," Blane O'Callaghan, director of engineering and maintenance, points out. He explains that whenever one of his staff members wants to turn on air conditioning, they just push a button, open two valves, and adjust a set point on their energy management computer. "In less than two minutes, we have cool air. It's just like turning a light switch on."
“If we had our own system, it would take a minimum of two days just to get the air-conditioning equipment assembled and working in the winter. When lives are at stake, you can’t afford to wait.”

But there’s still another reason to outsource, O’Callaghan says. “You never have to worry. ESC’s service has always been reliable.”

**For one midwestern university, outsourcing meant ‘getting rid of headaches.’**

Creighton University, cited seven years in a row as one of the most outstanding comprehensive universities in the Midwest by *U.S. News and World Report,* has outsourced its heating and cooling for nearly 20 years.

The man who made the decision to switch—Brother Frank Jelinek, S. J.—is still around. He has been at this Jesuit school for almost 50 years now. As head of campus facilities, he doesn’t regret his decision one bit. “In fact,” he points out, “it was a big load off my mind. I got rid of a lot of headaches.”

Brother Jelinek recalls that the 6,200-student campus—located just northwest of downtown Omaha—went through a building boom in the late 1960s, when it added a dental school, a medical research library and other facilities.

“Our old utility plant couldn’t meet our needs,” he explains, “so we built a new one in 1972, installing two 50,000 lb per hour boilers and two 1,250-ton chillers.” Then in the mid ’70s, Creighton-Omaha Regional Health Care Corporation and Father Flanagan’s Boys Home (known as Boys Town) announced plans to construct two separate but connecting hospitals on the west side of campus.

“They knew they could save money by having us handle their steam and chilling needs,” Brother Jelinek says. To accommodate the extra load of heating and cooling over a million square feet of space, Creighton installed two extra boilers, more than doubling its steam capacity to 270,000 pounds per hour. It also put in two additional chillers, nearly quadrupling its air-conditioning capacity to 8,500 tons of chilled water.

“We thought we were prepared for everything,” Brother Jelinek recalls, “but we were mistaken.” What Jelinek and others hadn’t anticipated was a host of administrative “headaches.” Some were brought on by expansion, he says. “For example, questions arose over outsourcing — some wondered if it would affect our tax-exempt status or how we would treat the income.”

But many were the result of the Arab oil embargo. Practically overnight, prices climbed 200 percent. “It was hard to know what to bill the hospitals because oil costs kept chang
Brother Jelinek made the decision to take Creighton out of the energy business and put ESC in charge of heating and cooling the campus instead.

"We no longer need an around-the-clock maintenance crew at our power plant — ESC takes care of that. Now we have special devices at delivery points in all of our buildings that enable us to keep better track of our energy usage."

In short, Brother Jelinek says he's glad Creighton is out of the utility business, focusing on what it does best — education. "And it's nice to be rid of all the headaches."

Outsourcing keeps this railroad on the right track.

Union Pacific Railroad (UP) — the second largest railroad in the United States — is on the right track. It has been outsourcing heating and cooling for its headquarters in downtown Omaha since the early 1970s.

UP switched for many reasons, according to Preston Sargent, manager of special mechanical projects. "For example, we didn't have space for cooling towers and chillers or the expertise to build and operate a plant without hiring additional people."

Continued on page 20
"We decided it would be far cheaper to pay for just the heating and cooling we use than to have our own equipment and people."

Outsourcing Heating and Cooling

Continued from page 18

"Maintenance was another problem," recalls Gary Sieburg, manager of building services. "We decided it would be far cheaper to pay for just the heating and cooling we use than to have our own equipment and people."

But the real issue, Sargent says, was the need for dependable service...especially in computer rooms, where even the slightest power interruptions or change in temperature can do an incredible amount of damage.

Herman Krahmer, manager computer services, explains that UP's two main frames in Omaha are connected with five other computers in St. Louis. Together, they act as the heart of UP's business, keeping track of 750 trains and 100,000 rail cars that are traveling across more than 17,000 miles of track each day. In addition, the system keeps up-to-date records on traffic lights and railroad crossings; ship­ments, inventory; billing and collections; payroll; and other vital information.

"We could lose millions of dollars if our system ever went down," Krahmer said. "That's basically why we're on line with Energy Systems Company. That's also the reason we have our own backup systems for our computer rooms and have built redundancy into them."

Krahmer goes on to say that UP's headquarters building has two service entry points for Energy Systems' pipeline and two others for the local water utility. It also has two uninterrupted power systems (UPS); two emergency, diesel-powered generators with a total of over 2,000 kilowatts; and three 92-ton backup chillers that are strictly for the company's data center.

"If the chilled-water temperature would ever fluctuate above 45 degrees," Krahmer says, "alarms would go off and we could automatically activate our own chilling units." In case of a power outage, the company's UPS systems automatically carry the load until the generators become operative.

"With this kind of system," Krahmer concludes, "we're always on track, ready for practically anything."

For Energy Systems, emergency generator ensures reliability.

In 1991, Energy Systems Company (ESC) installed a Caterpillar emergency generator for two basic reasons. "We wanted our customers to have the
highest level of service and reliability possible," says Ken Flegle, manager of operations. "We also wanted to be able to operate independently if a prolonged outage of electrical power occurred."

The generator set, which consists of a 3512 engine and a SR-4 generator, has a prime capacity of 1,100 kilowatts and a standby capacity rating of 1,250 kilowatts. Flegle explains that the set replaces a smaller system and was installed with paralleling switchgear for a total cost of $300,000. "Essentially the switchgear enables us to parallel and automatically move to emergency power without any interruption in service."

In customizing the emergency system, ESC installed a remote radiator with a 25-horsepower electrical cooling fan slightly above and in front of the engine so less power would be required for engine cooling. A direct-mounted cooling fan would have consumed 40 horsepower, Flegle says. In addition, ESC officials:

- specified a lower temperature rise in the generator when it ordered the system so the copper windings would be less susceptible to heat and have a longer insulation life.
- specified a smaller than normal allowable voltage dip to occur when the largest motor is started across the line.
- saw to it that the control system on the generator set had its own uninterruptible power supply (UPS).

- installed a blowby filter system in the engine crankcase to capture blowby that contains oil mist vapors and some of the gases used to push pistons down. It recycles the condensed oil so it can be used again for lubrication.

Flegle says customers have reacted very favorably to the emergency system. "They like having the added reliability," he stresses. "Reliability is extremely important to both of us."

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