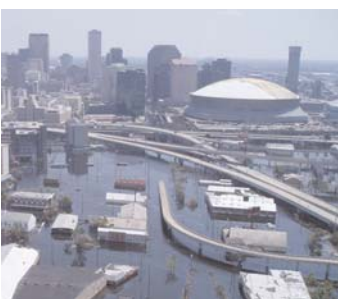


## Surviving Katrina: We ride out the storm and get back to business

*A personal experience from John E. Carlson, director of district energy operations for Entergy in New Orleans.*

Emergency planning is a normal process. In New Orleans, we know we live in a vulnerable area, so we review and update our emergency plans every



year prior to hurricane season. Under our plan, a skeleton crew remains at the plants, keeping them operating throughout

the storm. Personnel who evacuate check back in once the danger has passed and return as a relief crew. That normally works very well; but Katrina changed the rules.

Beyond the flooding, which in some areas was nearly 20 feet deep, communication proved the immediate and most difficult problem – no cell phones, no land lines, no email. Using the Blackberry PIN system, text messages and web postings, we found most employees.

But even dealing with these challenges, Entergy Thermal continued operating through the storm. A few hours after

flooding began, we shut our steam plant down for safety reasons when a steam leak developed in the basement of the last customer still taking steam, and flooding prevented isolation of the leak.



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## News Briefs

### Storm Brings New Customer



In the wake of the destruction which wreaked havoc on HVAC systems, some facilities are reconsidering the advantages of district cooling. Hurricane Katrina wiped out all of the New Orleans Veterans' Administration (VA) hospital's own chillers. As a result, the most cost-effective restoration solution was to contract with Entergy Thermal for district cooling service.

Entergy Thermal began laying pipe to the VA three weeks after the storm. Despite logistical complications caused by the storm's disruptions, the project has been on a fast track and was completed in a six week time frame.

### Houston's Christ Church Cathedral Service Expands

Entergy District Cooling was awarded a contract to expand the service provided to Christ Church Cathedral in downtown Houston. The project consists of expanding piping to the new church facilities which are being built on the lot adjacent to the cathedral. The project is slated to be online in the 1st Quarter of 2007.



### Houston Customer Research

Entergy Thermal recently began a comprehensive market research study to help our ongoing search for ways to improve service to customers.

We greatly appreciate your cooperation and willingness to communicate your experiences and thoughts. We will use the information gathered to help improve our service to you.

## Employee Spotlight- Jeff Davis - Production Superintendent



Jeff Davis joined Entergy Thermal's New Orleans operations as production superintendent in 2000. Almost immediately, he demonstrated one of his greatest skills – identifying and recruiting some of the most superior talent and experience in the metropolitan area. Jeff supervises the day to day operations of three facilities in the city's central business district.

Fortunately, Jeff's background covers the gamut. A former pipefitter and welder, and now a licensed engineer, he spent 20 years operating

office towers and hotels across New Orleans, supervising all aspects of building management. This experience has proved critical at Entergy Thermal, where he acts as primary liaison between the plants and customers' building managers or building engineers. Having managed similar buildings, he understands first-hand the customer's needs and challenges.

During Hurricane Katrina, Jeff's leadership ensured that the Entergy Thermal plants continued to operate without a hiccup, and that shut down and restart occurred methodically and safely for employees and customers.

### Surviving Katrina: (continued from page 1)

We were able to maintain our chilled-water service until Tuesday afternoon when we confirmed that our customers had either shut down, were preparing for or in the process of evacuating, or at a minimum, unable to take chilled-water service. By the time we methodically closed the plant and evacuated employees to safety by boat, the water outside was four feet deep.

### Returning to Waterworld

One week after the storm, Entergy Thermal Jeff Davis and John Carlson returned to the thermal plant along with a team of FEMA representatives.

The logistics of the trip itself were amazingly complex. Air space was being tightly controlled by the government to reduce sightseeing and manage air traffic. At least a dozen helicopters transporting people and supplies filled the sky at any given time. Security and health concerns mandated two security guards armed with automatic weapons and a medic as part of the 12-person group.

The team found that the ice tank had continued to keep the interior at about 70 degrees, although outside it was in the 90s. When they started one of our diesel engines, it fired right up. The plant itself sustained minimal damage. It was designed with flood elevations

in mind so the water only reached a peak depth of about six inches. All major equipment sits on housing pads and was therefore undamaged. The cooling towers also escaped unscathed.

The conditions at our boiler plant and a satellite plant were not as good, but not irreparable. These buildings had up to two feet of water, but we considered this problem to be minimal compared with the buildings around us. The focus was then on working with our customers to get them back in service. Like everyone, Entergy Thermal was simultaneously dealing with the personal suffering of its employees who were without housing or transportation, or, staying with families out of town.

On Sept. 11, we returned through the security check points manned by military guards. The remaining water around the plant had

dropped low enough for a pick-up truck to pass through. That week, we started cleanup, repairs, and pumping some chilled water through the distribution system.

Our plant processes worked well with only a few minor glitches. A few batteries went dead, one charger and one pump switch shorted out; but these were relatively minor items that we were able to work around. Because of the number of hospitals it serves, the thermal plant was

designed with a high degree of redundancy, so few repairs were needed.

One plant design parameter had been to provide critical service for patient-care areas for at least 96 hours. To meet this criterion, 8 MW of diesel generators were installed with 60,000 gallons of diesel fuel. In addition, the plant has an ice tank with 52,000 ton-hours of storage.



This made initial startup operations quite easy because the operator could meet system load using a distribution pump and the ice tank. This allowed flexibility for the operator to work on cleanup and repairs elsewhere during the day. Only as necessary did we operate chillers and rebuild the ice. Power was restored to the plant on September 19, right after the flood waters in the vicinity of the substation went down.

For a while, our offices became a makeshift headquarters for many of our customers until they were able to gain access to their buildings and get power and communication back in service.

While our plant always maintained its capability to produce chilled water, our customers' buildings were not able to use it.



Their building electrical systems had to be inspected and repaired prior to having the power turned back on. In many cases, it was necessary to make temporary

modifications to the building systems to provide power only from the second floor up because of flood damage. The first floors were damaged, and all lower floors were flooded. Water needed to be pumped out and sheet rock and all internal fixtures, furniture, etc., removed. Equipment and control systems needed to be rebuilt.

We have been working closely with our customers to coordinate the restoration of their facilities and their return to service. This has meant attending their meetings with contractors and being involved with their reconstruction schedules. We have also performed work that was an extension of our service. For example, we have taken on the responsibility to get customers' building pumps rebuilt and variable frequency drives replaced – even replacing the motors ourselves if necessary. We have worked as an extension of their staff, allowing them to focus on rebuilding their facilities and infrastructure.

Three weeks into our Katrina restoration,

Hurricane Rita appeared. What we had learned in New Orleans over the past weeks was put into immediate practice. The Astrodome became a staging area for emergency facilities in anticipation of a major hit by Rita on the Houston area. Getting the Houston plants secure and employees situated at the facilities or evacuated was the top priority of the week. Fortunately, Rita's intensity dropped, and a late course change avoided a direct hit on Houston.

## Customers Recovering

Today, our customers are gradually recovering their buildings floor by floor, and our chilled-water loads are increasing. A few of our customer facilities may not reopen or, at minimum, will not provide the same service as prior to the storm. On the other hand, we have been able to respond and meet the needs of others quickly. After one local hospital's chilled-water plant was flooded, the quickest and most cost-effective solution was to connect to our chilled-water lines and contract for service instead of rebuilding their plant. (See Veterans Administration brief.)

On Oct. 17<sup>th</sup>, the last customer that could take district cooling finally restored building power and was able to put HVAC equipment back in service. Other customers are still striving to return building electrical equipment to service to operate their chilled water pumps or other HVAC facilities.

Two months after the storm, the streetlights are still out and no one really cares which way you go on our one-way street, because so few cars are on the road. We still have to get our universities and hospitals back in operation. But we will get there, and district energy will make it easier for others to focus on their core business. With so many things in flux, one thing is certain, Entergy's district energy business survived a hurricane of catastrophic proportions, charted a course which was never envisioned in any emergency manual, and is focused on being part of the rebuilding of a new city. Already, we are back to business.

*John E. Carlson is director of district energy operations for Entergy in New Orleans. He can be reached at [JCARLS1@entergy.com](mailto:JCARLS1@entergy.com).*

### Entergy Solutions District Cooling

1401 Rusk Street  
Houston, TX 77002  
713-315-5205  
713-315-5213 fax

Contact: Steve Martins, [smarti4@entergy.com](mailto:smarti4@entergy.com) [www.entergysolutions.com/districtcooling](http://www.entergysolutions.com/districtcooling)

### Entergy Thermal LLC

1661 Gravier Street  
New Orleans, LA 70112  
504-569-2100  
504-569-2110 fax