

GAS SYSTEM RUNNING, BUT 840 MILES MUST BE REPLACED

by Jeff Griffin, Senior Editor

Entergy New Orleans, the provider of electricity and natural gas services for the city of New Orleans, may be the most troubled public utility in the nation.

The task of rebuilding electrical infrastructure to serve populated areas is mostly complete, although many residents of areas where power is available remain unconnected.

And although gas service is available to most areas where people are living and working, Entergy New Orleans must rebuild its gas distribution system. To accomplish that, more than 840 miles of new gas mains must be installed – most of it projected to be done by horizontal directional drilling.

“The challenges Entergy New Orleans has faced during Katrina storm restoration are unprecedented in the gas pipeline industry,” says Rusty Burroughs, regional manager for gas operations. “No other utility in the U.S. has had to deal with an outage of this magnitude created by a disaster of such devastation.”

Flooding that followed Katrina when levees failed is to blame for most of the city’s problems, including its damaged gas system.

“Flood waters caused significant structural damage to residential and commercial buildings, many of which literally floated off of their foundations or piers,” Burroughs continues. “As these buildings became structurally damaged, many were ripped away from the gas risers, creating an avenue for which flood waters could enter the gas system.”

Salt water intrusion

The most significant salt water intrusion into the gas system occurred in the low pressure (1/4-psi) system where the weight of the column of water was able to overcome the quarter pound of gas pressure and inundate the underground distribution system.

Some Bright Spots

Optimists believe there is a silver lining to every dark cloud.

And, indeed, Entergy New Orleans can identify several bright spots emerging from the last year’s storm and flood disaster.

When the company’s gas distribution system is completed, reliability should be improved, emphasized Rusty Burroughs, Entergy regional manager for gas operations.

“A significant accomplishment during storm restoration,” he added, “has been the safety record of our organization. With the many challenges they faced such as health hazards that required inoculations, security issues, massive amounts of debris that presented a logistical challenge, the pressure of getting a gas system back in service that incurred the most devastation ever in the gas industry, and their own personal rebuild challenges – our safety record was impeccable. There were no major injuries, accidents or illnesses, and only a few minor scrapes and bruises during the entire eight month restoration period.”

Safety issues aside, perhaps most significant is the collective response to the disaster of the company’s employees.



Continues Burroughs: “Salty flood waters entered approximately 534 miles of gas main pipeline and related services. This part of the gas system is comprised of pipes ranging in size from 4 to 30 inches and is roughly 50 percent steel and 50 percent cast iron. This enabled salt water to inundate approximately 310 miles of the high pressure gas system and related services. Water intrusion impacted approximately 60 percent of the main piping system, or about 844 miles of main piping and related services.”

There was also significant structural damage to above-ground gas system facilities, including damage to:

- 110,000 gas meters;
- 12 of 14 city gates and 64 of 73 regulator stations; and
- The entire rectifier system utilized to cathodically protect the steel piping system.
- Damage to other types of facilities included company vehicles, buildings, tools and equipment, and the company’s communications infrastructure.

More than 50 percent of Entergy New Orleans employees lost everything due to the storms and flooding – homes, cars, boats, pets, important documents, memories documented by little league trophies and family pictures. In some cases family members were among the fatalities.

“Most of the other 50 percent,” said Burroughs, “sustained some type of damage to their personal assets. Families were literally split apart for months; spouses were relocated to other cities with their jobs, family members were relocated all over the country, many for good. However, it is remarkable that even through all the loss and tragedy, heartache and sadness, employees reported to work with the courage, resolve, and fortitude it would take to begin the recovery process. They have been the strength and inspiration that is helping this organization overcome such a tremendous challenge rebuilding personal lives and restoring our New Orleans gas system. Overcoming these difficulties has resulted in a closer knit team that understands the strength and commitment it takes to succeed in the face of adversity.”

Even so, Burroughs says gas service was available to the majority of New Orleans geographically by the end of December 2005.

"Removal of salt water from the gas system," he adds, "took approximately eight months, the bulk of it having been removed while restoring gas service to customers. The total amount of water removed from the gas system is estimated at over 4 million gallons."

Safety first

As recovery work began, the first priority was to make the system safe. Efforts were hampered the first few weeks after the storm because access to the city was limited because of flood waters and security measures.

"Our objective," Burroughs continues, "was to restore service as quickly and safely as possible to customers in areas as they repopulated."

Steps taken to accomplish this included:

- Assessment of damage; 44 aerial reconnaissance missions were flown and ATVs, Humvees and boats were used to perform detailed inspections;
- The system was secured utilizing divers to operate valves and make repairs. This enabled Entergy New Orleans to maintain service to New Orleans Sewerage and Water Board's pumping system that was critical to removing flood water from the city; and
- Critical computer servers and maps were extracted from flooded facilities.

As flood waters receded, gas damage assessment crews followed, turning off meters to ensure safety of life and property.

Burroughs says the low pressure system was segmented into smaller grids for dewatering, which prevented water from re-entering dewatered areas. To remove water from the gas system required approximately 2,000 excavations, 1,100 gas main locations to be tapped for siphon installation, and over 3,000 siphon locations were utilized to pump water out of the system. As the water was removed, gas was introduced into the system utilizing regulator stations. As each part of the system was re-pressured, the system was surveyed for leaks.

"Each customer that had flood damage to gas appliances or had structural damage to their home was required to get an inspection and repairs performed by a licensed plumber," says Burroughs. "The process also required approval from an inspector in the City Safety and Permits Department. Prior to restoring service, we performed a lockup test to ensure the gas piping in the customer home was safe to receive service. Each appliance was individually checked for leaks and relighted."

If the system is operational, why must

much of the buried piping be replaced?

Entergy New Orleans says areas targeted for replacement are those served by cast iron and steel pipes that were flooded by salt water, reducing the service life of the pipes.

"New pipe," says Burroughs, "will include 844 miles of 2- and 4-inch high-pressure pipe polyethylene mains and 100,000 feet of 1-inch high-pressure polyethylene services. The rebuild project will be performed utilizing directional boring. In addition, 110,000 meters and regulators will be installed."

Replacement targets 2007

The utility company is hopeful work will begin during the first quarter of next year. Explains Burroughs: "Work has not yet begun and we await funding from insurance settlement proceeds and Community Development Block Grant assistance from the federal government that will be appropriated by the Louisiana Recovery Authority. If adequate funding is provided, we anticipate system rebuild construction to begin during the first or second quarter of 2007."

Should New Orleans residents be concerned with facing the winter depending on gas from a system with 60 percent of its mains needing replacement?

The Entergy New Orleans answer: "Some water will remain in the gas system due to low points in the piping created by soil subsidence over time. However, overall reliability for the gas system in the near term will be good and we expect no large area outages that would impact a large number of customers.

"We anticipate that gas outages will be intermittent in nature and typically impact only a single to a few customers during any one event. To ensure that reliable gas service is available to all customers prior to the upcoming winter heating season, a proactive plan has been developed.

"The plan includes ensuring adequate gas supply, mitigating outages by utilizing an ongoing siphon pumping program, and performing continuous sampling and visual inspection of pipe material and analysis of samples to monitor and take corrective action to maintain adequate system reliability."

Entergy New Orleans is in voluntary Chapter 11 bankruptcy, and a motion filed earlier in the year requesting an extension for filing a plan for emerging from bankruptcy protection claimed it was impossible to realistically estimate projected income because much of its service area remained unpopulated.

Despite positive projections from city officials, there appears to be little progress to bring displaced residents home, creating financial uncertainty not only for the city's provider of electricity and natural gas, but

for all area businesses.

"While we continually forecast what we anticipate the customer base to be over the next five years, there is no certainty as to when and how much repopulation will occur," Burroughs says. "We are currently basing our plans for system rebuild on where the repopulation has occurred or is occurring, and the condition and reliability of the system in damaged areas." ■