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MANAGING EMERGENCY COMMUNICATIONS

Harrison County, MS

Radio System Weathers the Storm in Mississippi

By Mike Scott

Hurricane Katrina caused communication systems across the Gulf Region to be almost unilaterally destroyed. Yet a system in Harrison County, Mississippi that remained functional can provide law enforcement officials from around the country clues as to how they can better prepare for the most powerful of Mother Nature's storms.

The Harrison County system, which supports five primary and four secondary PSAPs, was designed to withstand hurricane-force winds in excess of 150 miles per hour and gusts of 200 mph, which were both experienced during Hurricane Katrina. But despite all the work that went into constructing towers and other equipment, perhaps the biggest reason the system prevailed was planning and training.

"Whether you maintain your system in-house or outside, it is critical for first responders to know exactly what their system is, the parts it needs and that redundant files are located offsite," said Robert G. Bailey, telecommunications manager for the Harrison County Emergency Communications Commission. "The second biggest key for us was that we developed a plan to train our staff every year before hurricane season and to do so during different shifts and to even test backup systems. Training is so critical."

There was a third non-technical reason that Harrison County's communica-

Downtown damage from Huricane Katrina includes this New Orleans Police Department Control Point surrounded by 5 feet of floodwaters.

VIA M/A-COM

tion system survived and even thrived following Katrina. Bailey said the pre-established response plan included a standing agreement with various vendors and communications service providers. As a result, ground support arrived on the CAD and 9-1-1 sides. These exclusive commitments with vendors included checking every tower site for damage and repairing bent antennas.

The communications system in Harrison County, indeed fared better than most in the Gulf Regions in the hours and days following the devastation of Katrina. The only impact to the county system, in fact, was that its microwave dishes were realigned by the strong winds, which forced technicians to align the dishes properly once the storm passed.

Yet even with these winds, the system functioned near 100-percent, with only some minor issues in audio quality. One of the microwave dishes that experienced some decrease in viability was automatically taken off line to meet safety protocols but even that dish was fixed within hours of the Katrina's eye passing over the area. Bailey directly credits that advanced planning and a strict attention to details.

There is more to the plan, though, than redundancy and training. "The design of the towers was based around some extremely stringent requirements that the local consulting engineer (Moses Consulting of Mississippi) helped to put together," said Rick Casteneda, regional director for the southern region for M/A-Com, a division of Tyco Electronics and the provider of the Harrison communications system.

These stringent requirements likely will be considered by public safety entities throughout the Gulf Coast region as a model way to increase the likelihood of a viable communications system in the days following even the most catastrophic of storms. There are three main physical components to this system that set it apart from many others that were unable to function because of Katrina's elements:

- The tower sites were built on cement platforms 15-20 feet above ground and the towers themselves reached 300-400 feet in the air.
- Vendor products were 100-percent compliant with this stringent design and the towers were designed and built to sustain hurricane-force winds. Most of the towers were built no less than 4-5 miles inland.
- Microwaves were used rather than relying on telephone lines so no additional commercial operators were relied upon. As a result the Harrison County system was virtually self-sufficient.

"The normal construction standard looks at 100-year flood plans," said Bailey. "In public safety, we have to look at 500-year flood plans. So we added four feet on top of what that 500-year plan called for in terms of tower height."

In the days that followed the storm, Harrison County's 9-1-1 system was the only one in the immediate area that worked. Local law enforcement departments are responsible in Harrison County for their own dispatch and communications centers and most were completely or partially destroyed.

Bailey said law enforcement personnel utilized desktop control stations in viable police and fire vehicles that weren't significantly damaged by the storm. This technology allowed the lines of communication to remain open and improve the viability of portable backup radios. Those stations were connected to outside magnetic antennas.

As for countywide interoperability, the plan Bailey referred to called for a common talk group of frequencies to allow agencies from around the county to coordinate public safety communications. As a result those first responders knew which channels to turn on using their working equipment to become part of the operating communications system.

"Our system has to be at its best when we need it most," said Bailey.

It took only a day for Harrison County to realize it was the only county in the area with a working communications system. Neighboring communities often had nothing more than portable car-to-car communications and no transmitters. Some 800 MHz repeaters frequencies were made available to those first responders.

Casteneda said M/A-Com deployed radios to neighboring communities that used different public safety vendors and optimized the Harrison County system to adapt to the increased communications workload. Temporary sites were established and some still remain within the county.

"At that point there is no concern over being competitive with others in our industry," said Casteneda. "We supported volunteer fire departments and other first responders around the area with loaner radios and other needed equipment."

Local law enforcement officials also benefited from network service providers like Communications International from Vero Beach, Fla., which assisted M/A-Com and other vendors with support and restoration efforts. Communications International set up mobile communication vans and made some of them into sleeping quarters for its technicians who were often working around the clock.

Perhaps the best example of how well Harrison County's M/A-Com system functioned during and after Katrina, Bailey said an average month includes over a million push-to-transmits in Harrison County. Within the first two weeks after Katrina hit, there were well over 2 million such functions that passed through the county's system.

"And there was no degradation of quality," Bailey said. "That's the ultimate test."

Challenges in New Orleans

Meanwhile, across the state line, M/A-Com systems in New Orleans were more directly affected because one of the main generators failed when radiator coolant ran out. It was pierced by wind-driven debris at the height of the storm on Monday, Aug. 29. It leaked coolant fluid, causing the generator to fail and disable key transmitters.

Since there was no easy way to get to that generator, and since most air units were being used for rescue efforts, it was nearly three days before the coolant

could be filled and the communications system was back online.

But there were other logistical problems that M/A-Com and other communications vendors faced. In the wake of citywide flooding, some technicians were not allowed into the city on the orders of New Orleans State Police and local law enforcement departments because of orders handed down from the upper levels within those organizations. Casteneda admitted that this caused some frustrating times for all parties involved.

"We essentially are first responder support and there needs to be a way in which we can show our credentials and get into the affected area," said Casteneda. "Those law enforcement officials were faced with so much and were dealing with so many issues it is understandable they wanted to clear the city of people, but our technicians were often stalled so that the systems couldn't be put online in as fast a manner."

In addition to the City of New Orleans, M/A-Com provided replacement parts and technical services to 21 other customers in the region, from Louisiana State University to a local NASA facility.

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The New Orleans Fire Department dispatch facility operating inside a tent, after being forced to move when their building was flooded. Control Stations and portable radios were used on their existing radio infrastructure to dispatch NOFD and to coordinate fire and rescue activities with other first responders.

Lessons Learned

Casteneda said one issue M/A-Com is looking at is whether backup generators should be included at all site locations that would prevent a coolant leak or disappearance from shutting the system down as quickly as it did in New Orleans city proper. "You won't use the redundant generator often but when it is used that is when it will be needed most," he said.

Another issue to consider is streamlining the process to allow first responder support to gain access to an affected area. Casteneda suggested developing an industry-wide identification card much like an American driver's license that would be easily recognizable to law enforcement officials.

"All communications vendors would need to have the same type of identification but it would really help public safety officials on the ground," he said. 9-1-1

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