

CHANNELS

IP COMMUNICATIONS

The magazine for IP-based voice, data & interoperability solutions

SPECIAL EDITION

FLORIDA RIDES OUT THE STORMS

HOW FLORIDA KEPT ITS
CRITICAL COMMUNICATIONS
ONLINE DURING THE
STATE'S WORST TROPICAL
STORM SEASON
ON RECORD

On the Cover: Hurricane Jeanne heads North, Sept. 27, 2004.
Below: Hurricane Ivan, approaches the Gulf, Sept. 12, 2004
Photos: NASA

By all accounts, a devastating season

2004 was an unusually active and devastating year for tropical cyclones in the Western Atlantic and Caribbean. The toll on human life and the damage endured by many countries resulting from these storms were immense. In this *Channels Special Edition* we focus on the effects of this horrific season on the State of Florida and its new Statewide Law Enforcement Radio System (SLERS), which withstood its first major test since becoming operational statewide this year. By examining just how the SLERS network was able to continue providing the critical communications so necessary during prolonged emergencies, we hope to help others who shoulder the responsibility of the public's safety to do so more easily, reliably and cost effectively.

Tropical Storm Bonnie: prelude to a continuing state of emergency

"The system maintained operational status throughout these devastating storms."

Simone Marsteller

From August through late September, storms lined up one after the other to rake the tropical regions with their ferocity. Four powerful hurricanes – the largest number on record to strike Florida in a single season – ripped through the state smack on the heels of Tropical Storm Bonnie. After moving up through the Gulf of Mexico, Bonnie kicked-off the season on August 12 with a pass through Apalachicola in the Florida panhandle. The very next day, Hurricane Charley pummeled the offshore islands near Ft. Myers and moved inland.

In September two major hurricanes, Frances and Jeanne, made landfall within a few miles of each other along the Atlantic Coast between Ft. Pierce and Jupiter. They hit just twenty days apart. Between them was Hurricane Ivan.

Fourteen days after it formed, Ivan appeared to be heading directly for Mobile, Ala. During the early morning hours of Sept. 16 it veered to the east, making landfall at Gulf Shores, Ala. and brushed the Florida panhandle as it moved inland. It was a trying time for all, and the

death toll and devastation of those six-and-one-half weeks of assault will not soon be forgotten.

But: Critical communications remained

Despite the terrible destruction, Florida's situation might have been worse if the state's critical communications networks had not been up to the extreme challenges faced over such an extended period. Numerous M/A-COM radio networks deployed across the state continued to operate during the height of the storms.

"While many other local systems and cell phones were failing at the height of the storms, M/A-COM's systems continued to operate," said Glenn Cannon, Manager-Public Safety/Government Relations. "This was due primarily to the precautions, planning, and preparations made by federal, state and local public safety and service agencies throughout the state."

Perhaps most fortunate of all was the fact that the Florida Statewide Law Enforcement Radio System (SLERS), which covers 60,000 square miles (including 25 miles offshore), and had become fully operational statewide earlier in the year, remained online throughout the entire ordeal. Tom Brooks, radio system manager for the Florida State Technology Office, explained how important this was to the state's recovery operations.

"The statewide radio system served as the primary method of communications for many first responders. During Hurricane Charley the radio system remained operational before, during and after the storm. In addition to law enforcement work, the system was used to coordinate the restoration of other communications services within the affected area,

including wire line and cellular telephone services,” Brooks said.

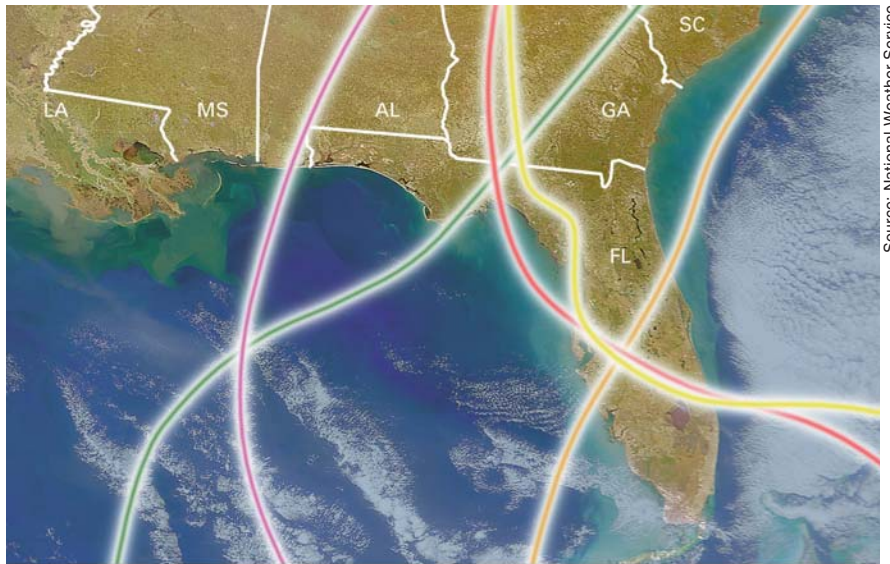
A month later, during Hurricane Frances, the statewide radio system again played a major role. “Interagency radio patches were put in place prior to the storm to interconnect legacy systems and the M/A-COM statewide system. This provided the State Emergency Operations Center in Tallahassee with direct radio communications to affected areas over 400 miles away,” noted Brooks.

“Hurricanes Ivan and Jeanne further demonstrated the resilience of the new statewide system,” said Brooks. “Although damage occurred to some antennas in both storms, the problems were quickly overcome through the use of alternate antennas and links and by the rapid response of the repair crews, who often were out making repairs before the weather had fully cleared. Disruptions to full wide-area operations were isolated, minimal, and quickly restored.”

“The strength and quality of the Statewide Law Enforcement Radio System were clearly demonstrated during the recent hurricanes,” said State Chief Information Officer Simone Marsteller, adding that “the system maintained operational status throughout these devastating storms.”

Fred Dickinson, Executive Director of the Florida Department of Highway Safety and Chairman of the SLERS Taskforce, also had praise for the network. “The Statewide 800 MHz system worked extremely well for the beleaguered state responders. The strength

Florida’s SLERS: 45 days, five hits, no errors



Source: National Weather Service

Storm:	First U.S. landfall:	Max. wind speed:
Tropical Storm Bonnie	Apalachicola, 12 Aug.	65 mph
Hurricane Charley	Cayo Costa, 13 Aug.	145 mph
Hurricane Frances	Sewall’s Point, 5 Sept.	145 mph
Hurricane Ivan	Gulf Shores (Ala.), 16 Sept.	165 mph
Hurricane Jeanne	Stuart, 26 Sept.	120 mph

A composite view of the storm tracks shows where each “eye” passed over the earth. As can be seen from the satellite photos, each storm can extend for up to 75 miles or more from the center.

of M/A-COM, its products and operations teams was clearly demonstrated.”

All concerned agree that one key to the performance of the SLERS network was the extraordinary effort that had been put into the project. “All of the time, energy and planning that the state put into its SLERS network paid off,” Dickinson said.

Preplanning, design, real-time monitoring and support cited as crucial elements in the network’s solid performance

In the days following Hurricanes Charley and Frances, Guy Tunnell, Executive Director of the Florida Department of Law Enforcement, cited what many believe to be one of the crucial elements in the successful functioning of the statewide radio network during the emergencies.

“M/A-COM’s disaster and pre-event planning allowed for immediate response to system issues as soon as the teams could safely enter an area,” Tunnell said. “The preparation and response kept the SLERS system operating before, during and after the events. This permitted the various agencies to communicate and the officers to be safer as they performed their storm-related duties in an extremely difficult environment.”

Legacy radios not excluded

During Hurricanes Frances and Jeanne, which approached from the east and southeast on the Atlantic side of the peninsula, the statewide radio network faced its toughest challenge. While tied into the SLERS network and functionally a part of the system, the southernmost part of the region was still operating on older legacy radios and there was some initial concern about how well the statewide network would interoperate with the legacy equipment. Such concerns proved unfounded.

“SLERS provided the State Emergency Operations Center in Tallahassee with direct radio communications to all affected areas,” said Brooks.

Legacy systems have been totally replaced

“All of the time, energy and planning that the state put into its SLERS network paid off.”

Fred Dickinson

continued →



AP/Wide World Photos

National Guardsmen delivered food, water and ice to people in need due to flooding from Hurricane Jeanne on Tuesday, Sept. 28, 2004, in Gardner, Fla.

“While many other local systems and cell phones were failing at the height of the storms, M/A-COM’s systems continued to operate.”

Glenn Cannon

with M/A-COM 800 MHz radios in the remainder of the state, and the benefits were amply demonstrated in the successful operation of the network not only during the storms, but also in routine day-to-day operations.

“The diverse mix of legacy radio systems for all our State Law Enforcement agencies has been replaced by updated and reliable 800 MHz equipment with more channels. These agencies now have statewide mobile radio coverage and substantial portable radio coverage throughout the state,” Brooks said.

Furthermore, as a result of the improved interagency communications capabilities and the flexible architecture of the dispatch console systems, Brooks said that agencies on the network have been better able to standardize and integrate their operations.

“A powerful tool of the SLERS that was first used by state agencies during these hurricanes is the ability to shift radio dispatcher duties from one dispatch center to another with a few computer keystrokes. This feature allowed the Florida Fish and Wildlife Conservation Commission to quickly switch dispatcher duties to another dispatch center so that one in the path of the storm could be closed for the safety of personnel. This feature is another reason why SLERS is a very resilient system,” said Brooks.

Alliance Partners also key

Responsibility for day-to-day operation and maintenance of the statewide radio network belongs to M/A-COM. William Tinsley, the company’s director for State of Florida operations, explained how this is accomplished.

“We maintain a Network Operations Center [NOC] for the SLERS at our regional facility in Orlando. The NOC is where we monitor every site within the network, and it is the home base for the mobile unit that we dispatch whenever required,” said Tinsley.

The more than 200 individual sites that stretch across the state are maintained by the two M/A-COM Alliance Partners in the region, Williams Communications and Communications International, Inc. While Tinsley functions as the primary contact and coordinator with the Florida State Technology Office for the SLERS network, it’s the Alliance Partners who carry out the day-to-day and emergency operation and maintenance of the individual sites.

Both Williams Communications of Tallahassee and Communications International (CII), headquartered in Vero Beach, have decades of experience with M/A-COM’s radio equipment in the region.

“M/A-COM serves as the prime contractor on the design, implementation and daily operation of the network backbone for the state,” says Tinsley. “We provide the technology, equipment and overall management for the project. Our two Alliance Partners provide the hands-on, day-to-day site operation and maintenance. They and their crews deserve much of the credit for ensuring that the network continued to deliver the critical communications that were so necessary for the safety and security of Floridians statewide. They did a terrific job, and we and the state are fortunate to have two such capable, experienced and well-trained partners.”

It is clear that the decades of experience with the often severe weather typical of Florida pays dividends in reliability. “We’ve been doing this for a long time,” said Henry Erfurt, vice president of CII. “It’s all about being prepared.”

These preparations have become routine. “Before any anticipated emergency, we continually monitor all sites and send crews out to visually inspect each one. We check to be sure that there are spare parts on hand, that doors are sealed and secured and that fuel levels are sufficient for the backup generators. And of course, you don’t leave personnel in harm’s way. You get them to a safe place, but one where they can respond quickly when necessary. During an event we communicate with everyone at least every four hours to be sure that they know what the situation is, and so that we know they’re okay,” Erfurt said.

Why Florida's statewide network performed so well

- It was designed from the outset as a high-grade public safety network with the necessary coverage, back-up, redundancy, capacity, fail-safe operation and good structural design.
- The Network Operations Center (NOC) provides remote, real-time monitoring of key site and system parameters. The entire system can be remotely monitored from any secure (VPN through DSL or LAN) internet location.
- Extensive preplanning and coordination at all levels of government – State, County, Municipal and Federal – allows for the timely exchange of information and direct communications, statewide, for all necessary agencies during emergencies.
- Effective pre-event coordination, planning and pre-staging of necessary personnel, spare parts, and fuel for standby generators as well as real-time monitoring of every site in the network.
- Well-trained and supported rapid-response teams who could be dispatched within minutes were in place throughout the state.

First line of defense

As the other Alliance Partner charged with the ongoing operation and maintenance of the SLERS network, Williams Communications not only installed and maintains the infrastructure in 37 counties in the north but, like their counterpart to the south, are the first line of defense during emergencies.

“On a daily basis, we provide two-hour response time for any of the 100 sites located in our area,” said owner Ken Williams. “We also provide terminal maintenance at our Tallahassee facility.”

Asked why he thought the SLERS network survived the season with only minor difficulties, Williams cites three primary reasons.

“First, the system was designed to the highest standards of public safety. That means it has the coverage, capacity, emergency power generators, backup and structural design necessary to withstand the storms that we typically get in Florida. Every penny spent for the design and construction of this network has been well spent: the record proves it.

“Second, it's a *network*, which means that all the sites can be monitored in real time from many locations – our technicians can ‘drill down’ to many levels of information and know exactly what's going on at any given site. This gives us a tremendous advantage in keeping our sites in operation. For example, we monitor the signal strength of the microwave antennas used for the backhaul throughout the network. These are incredibly sensitive to alignment, and we can see, in real time, how the winds are affecting each individual site. We know immediately when a particular site is in trouble, and can take the necessary steps to

ensure that the right crew, with the right equipment, can get there and fix whatever problems may arise.”

And finally, it's the people: “our crews are well trained, well supplied, and well motivated,” said Williams. “They were on station for weeks at a time. We had to ferry food and fuel out to them because they couldn't leave the sites. These guys did an incredible job.”

System design cited

CII's Henry Erfurt agrees with Williams' assessment of the overall design, network advantages and the importance of experienced, well-trained and well-supported crews. He also cites the advantages of the M/A-COM system design.

“Most people don't realize just how reliable and robust an EDACS network is,” he said. “As long as you have two working transmitters, you're still trunking and calls are getting through. In the end, it's all about maintaining the critical communications that those in public safety and service require. We always have to remember that lives are on the line.”

Mobile County knows the drill, too

Mobile County, Alabama lies less than sixty miles west of Pensacola. While largely spared from the effects of this terrible hurricane season, Mobile too knows about the severe damage hurricanes can produce, and their critical communications network has been



AP/Wide World Photos

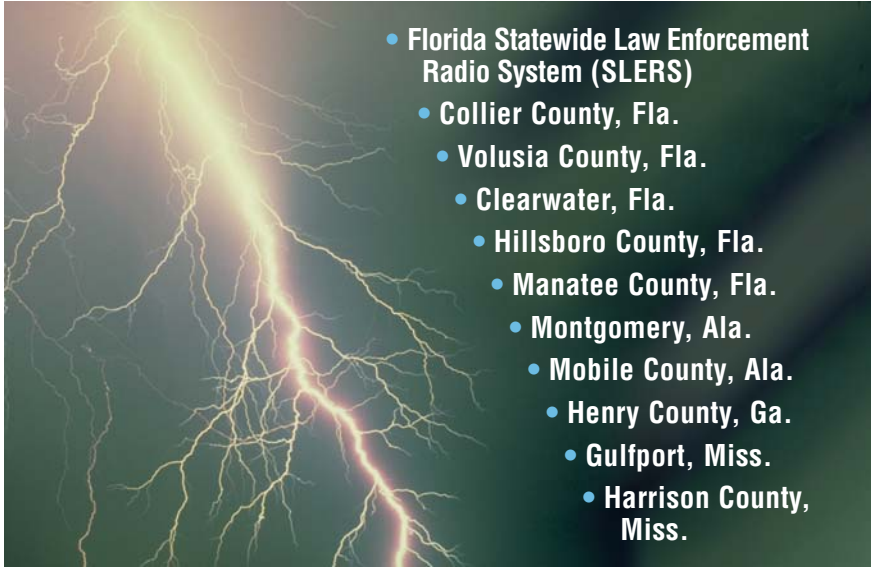
Tampa, Fla. police officers drive along Bayshore Blvd., in Tampa, as the remnants of Hurricane Frances cause water to spill over the sea wall on Monday morning Sept. 6, 2004 .

“In the end, it's all about maintaining the critical communications that those in public safety and service require. We always have to remember that lives are on the line.”

Henry Erfurt

continued →

Major M/A-COM Systems in the Gulf Region



- Florida Statewide Law Enforcement Radio System (SLERS)
- Collier County, Fla.
- Volusia County, Fla.
- Clearwater, Fla.
- Hillsboro County, Fla.
- Manatee County, Fla.
- Montgomery, Ala.
- Mobile County, Ala.
- Henry County, Ga.
- Gulfport, Miss.
- Harrison County, Miss.

All of these public safety systems remained online, delivering the critical communications they were designed to provide during the record-breaking 2004 hurricane season.

carefully planned and upgraded over its long lifetime as a result.

“Our EDACS system went online in 1992,” says Electronic Systems Supervisor Eric Linsley. Names like Erin, Opal, Danny and Georges, all major hurricanes that swept the county in the past twelve years, are well remembered by Linsley and everyone else in the area. On the night of Sept. 15th, all eyes were on hurricane Ivan as it was spinning up the Gulf, heading straight for Mobile.

“It was predicted to come ashore right at Mobile,” said Linsley. “We had taken all the usual precautions, such as checking and securing all of our sites and ensuring that emergency generators were fueled and ready to go.

What others can learn from Florida's experience

The severe test of critical communications in Florida and the surrounding region that resulted from this unusual hurricane season produced both winners and losers with regard to the technologies employed. The losers tended to be those that relied upon systems that were not designed from the outset to meet the stringent demands of public safety. This was clearly expressed by Mobile County's Eric Linsley, among others.

“I'm a big fan of private networks that don't rely on the ability of public carriers to keep their networks operating during emergencies,” said Linsley. “I'm not trying to knock them unfairly; it's just that they have different constituencies and different priorities. Public

We always turn off the individual call and telephone interconnect features during emergencies so that only group calls – which we feel are the most important – can get through.

“During that evening and into the morning of the 16th we monitored the track of the storm continually, in real time. This was the first time we've been able to do that, and it was a major help. Fortunately for us, the storm track veered and it came in at Gulf Shores, a few miles east. The most powerful sector of a hurricane is the northeastern quadrant. We were hit by the normally less severe western quadrant, but we still had a lot of wind damage in our area. We set a new peak in emergency traffic with about 333,000 push-to-talks – more than double our usual 155,000 ppts per day.”

Asked what he believes is the most important element in keeping a critical communications network on line during such emergencies, Linsley's reply was to the point. “The original design has to be up to the demands of public safety with backups, redundancy and good coverage. It has to be a system that can withstand the loss of a single site without total failure. Once that's taken care of, you have to keep your system up to date. If you plan for and schedule software and hardware upgrades on a regular basis like we have, you can stay on top of your critical communications network and continue to provide the best service possible to your user groups for the least amount of money. Look at us – we have a twelve year old system that's still delivering the performance and reliable service we need. It just makes sense to keep it that way.”

“A powerful tool... is the ability to shift radio dispatcher duties from one center to another with a few computer keystrokes.”

Tom Brooks

safety networks cannot afford to be overloaded during emergencies because that is exactly when they are needed most.”

Additionally, public carriers must set priorities for the restoration of service. It's often a matter of scale. Public networks may have hundreds of thousands – even millions – of subscribers for whom communications is mostly a convenience, not a necessity. Yet because of their very numbers they have a lot of clout with the service provider. It is after all a “public” network.

Public safety systems tend to have fewer users. But those users are extremely important to the safety of the community they serve. Emergency medical teams, firefighters



Medical personnel attend to patients in a tent hospital along the edge of downtown Punta Gorda, Florida, on Aug. 23, 2004

and police cannot wait for the restoration of critical communications.

The promise of the network

As demonstrated in Florida, Network Operations Centers – NOCs – are revolutionary in their impact on critical communications because they allow real-time monitoring of literally thousands of operational parameters. This paints an accurate picture of the network and aids greatly in maintaining its integrity. And an important safety factor in the monitoring process is the ability to do so from different locations.

A perfect example is the “mini-NOC” maintained in Jacksonville by Williams Communications. “During Hurricane Ivan, which hit just west of Pensacola, we monitored the situation from our mini-NOC. At four o’clock in morning we learned that one of our backup generators was down; yet we were able to dispatch a local technician and get the site back online quickly because we knew what the situation was immediately, even though we were nearly two hundred miles away,” said Williams.

The importance of keeping current

An inescapable conclusion of the events resulting from this unusually active hurricane season is that the age of the critical communications network need not be an issue. The SLERS radios and system are the latest. Yet, as seen in Mobile County and numerous other EDACS networks within the region (*see box, page 5*), systems that were originally installed over a decade ago are still providing superior service and reliability today.

“The fact that we have a twelve-year-old

system that continues to grow and serve our community shows how important it is to keep your system up to date,” said Linsley. “It just makes sense to stay on top of your critical communications network so you can offer the best service possible for the least amount of money.”

The Florida statewide network is no less an example. “The state has the responsibility for the establishment of seven Regional Communications Centers, and they have done an incredible job in the design and implementation of those centers. It is now up to the state, M/A-COM and our Alliance Partners to ensure that the network continues to grow and serve its community of state, county and municipal agencies far into the future,” said Tinsley.

Radio System Manager Tom Brooks agrees that the partnership has produced a strong relationship that will serve the needs of all Floridians for years to come.

“M/A-COM has been responsive to the issues raised by users and the State Technology Office,” Brooks said. “They have been willing to review how the system is being designed and implemented, as well as how to best accommodate the varied needs of our client agencies, from the special agents that work in urban areas to the wildlife officers out in the most remote woods and swamps.”

The next important milestone for SLERS is the integration of the state’s many local law enforcement and public safety agencies onto the statewide network. “The State Technology Office is currently in the process of developing an administrative rule. Once this process is complete, we will begin to enroll the local agencies,” said Brooks. ■

CHANNELS

is published by M/A-COM
221 Jefferson Ridge Pkwy.
Lynchburg, VA 24501

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A brief look at Florida's SLERS

The result of thorough planning culminating in an agreement with M/A-COM in September, 2000, the Florida Statewide Law Enforcement Radio System:

- Consists of an all-digital radio network covering 60,000 square miles (including 25 miles offshore), uniting thousands of state law enforcement officers under one statewide network.
- Is accessible through seven Regional Communications Centers.
- Serves 17 State agencies and is now accepting applications from all eligible city and county agencies who wish to join the network.
- Provides users with the degree of autonomy they desire but with the capability for statewide roaming and dispatch when required for emergencies and first-responder activities.
- Is technically advanced and meets state and local agency needs for advanced encryption, data, and interoperability with many existing legacy systems.
- Maintains a web site with all pertinent information at <http://sto.myflorida.com/slers/>

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