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New Digital Radio System Goes Down for Five Hours, Raises More Concerns

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Reporter: Mike Waterhouse

Email Address: mike.waterhouse@wsaz.com

 [Carper's Letter to Secretary Spears \(7/11/08\)](#)

 [IRP Press Release \(7/22/08\)](#)

 [Carper's Letter to Secretary Spears \(8/25/08\)](#)



UPDATE: 8/27/08 @ 4:37pm



CHARLESTON, W. Va. (WSAZ) -- A faulty wire connector is to blame for a failure in West Virginia's digital radio system last week that forced Charleston Firefighters to go back to their legacy, analog radio system.

The problem was first noticed last Wednesday (8/27) at about noon. Dave Erwin, Kanawha County's Emergency Operations Coordinator, tells WSAZ.com the cable connector caused one of the towers in Charleston to lose its connection with the rest of the statewide network, including the main control switch in Marion County. The cable, a standard Ethernet cable, and connector were factory produced.

Normally, the radios would continue to work with that tower, as it goes into "site trunking" or local mode, but Erwin says the radios used by Charleston Fire and Police were programmed to default to another tower during such a situation, which was out of range. So, Charleston Firefighters switched back to the analog system during the five-hour outage.

"I wish it didn't happen," said Erwin, who added that he felt fortunate that such a glitch occurred this early in the roll-out process.

Right now, the only agencies using the state's digital system are Charleston Fire and the traffic division of the Charleston Police Department. Erwin says no emergency radio traffic was hindered during this outage.

"This is not unusual," said Kent Carper, President of the Metro 911 Board, referring to problems associated with radio systems in general.

Carper says radio systems, analog or digital, have always been known to have trouble from time to time. He mentioned that the analog "legacy" system for Charleston Police has been having issues for the last couple days.

Nevertheless, last Wednesday's outage still has Carper looking for answers. On Monday, he sent another letter to Secretary Jim Spears in the West Virginia Department of Military Affairs and Public Safety. [Click here to read it](#) (PDF)

"It is my understanding that, in this case, it was a 20-cent cable connection that disabled the entire site," wrote Carper in the letter. "While there are kinks in any new system, I am becoming more and more concerned as to the level of redundancy built into the IRP system and whether there are sufficient resources to troubleshoot problems that will occur."

Carper deems the five hours it took to get the system back online after it first went out "unacceptable."

Erwin says a state technician had to come in from Sistersville, West Virginia, where he was working on a different tower site.

Erwin, who represents Kanawha County on the WV Interoperable Working Group (IWG), says 6 or 7 technicians who work for the state maintain the equipment--and the long term plan is to have technicians in strategic places across the state in the event a tower site goes down. West Virginia State Police technicians are also supposed to be trained to be able to work on the system.

"As new agencies come on [the IRP system], we're going to find glitches," said state IRP Coordinator, Mike Todorovich.

He tells WSAZ.com his office is still investigating last Wednesday's system failure, but they're working toward preventing future incidents like Charleston experienced last week.

"We know what happened," said Todorovich. "We just need to figure out how to make sure it doesn't happen again."

Todorovich says part of such prevention includes more training for local site technicians so they can troubleshoot some problems, and creating a better point of contact so that the closest technician responds to the site.

"People's lives are represented by these things," said Todorovich. "It is our responsibility to make sure it works right."

The statewide digital radio network is a work in progress that's growing very quickly. Todorovich says it's about 40-50% complete, and they're constantly tweaking settings to optimize its functionality.

Despite reassurances from the state, not everyone is happy with the interoperable radio system.

Roger Channell of the Marion County Fire Association, sent an e-mail to the "West Virginia Firefighters" group on Yahoo.com announcing that eleven of the thirteen fire departments in Marion County voted to set the trunking system radio system on the back burner.

"Due to the lack of confidence in the system, Marion County will be working toward a non-digital high band system that we feel is more reliable."

Channell goes on to say that even though some of the digital system is already installed, use of the analog system is "strongly recommended."

"We feel the digital system may have good potential one day, but not yet," wrote Channell. "We are not willing to put live on the line for a good idea."

On the other hand, Jefferson County just completed testing on its digital radios, focusing on the concern over the effects of ambient background noise during radio transmissions. Almost all of their tests proved successful. [Click here to read the report](#) (PDF)

UPDATE: 7/25/08

WSAZ.com obtained a copy of a news release sent out from the West Virginia Interoperable Working Group (IWG) regarding the recent concerns over the radio system. [Click here to read it](#) (PDF)

UPDATE: 7/15/08 @ 4:17pm

CHARLESTON, W.Va. (WSAZ) -- The West Virginia Department of Military Affairs and Public Safety (DMAPS) says it wants to meet with Kanawha County officials to make sure the state's digital radio system is headed in the right direction.

According to DMAPS spokesperson, Joe Thornton, the state identified the recently brought up issues years ago when it was first starting to implement the system. He said the state did extensive research to make sure the Motorola P25 digital radio system was the best solution for statewide communications.

Thornton says the state plans to follow recommendations from accredited organizations like the International Association of Fire Chiefs. It has "best practices" for digital radios listed on its website.

Even though at least \$40 million has been spent on the interoperable system, Thornton says the state will alter its course if it is found the radios will not be effective.

Thornton says the state's interoperability system does have the ability to handle both day-to-day communications and statewide emergency communications, despite comments suggesting otherwise from local firefighters.

The state has been in communication with Motorola to try to resolve some of the issue reported by other agencies.

The meeting between Kanawha County leaders and Secretary Jim Spears with DMAPS has been moved from Friday to Monday. We'll keep you updated with what happens at the meeting.

UPDATE: 7/15/08 @ 1:39pm

CHARLESTON, W.Va. (WSAZ) -- Metro 911 Board President Kent Carper has requested to meet face-to-face with state officials about West Virginia's Interoperability digital radio system.

WSAZ.com contacted Carper last week about concerns raised by local firefighters regarding the state's radio system -- and he says he's since reviewed the matter. The day after the story aired on WSAZ, he sent a letter to Secretary Jim Spears of the Department of Military Affairs and Public Safety and Governor Joe Manchin, asking to meet with them "about these concerns." (click on PDF)

link above to read the letter)

Carper would not elaborate on his exact concerns of the state system, but says he's personally looking into it.

Carper admits that Kanawha County's analog system is aging, saying he's been pushing to upgrade it for years -- especially for county firefighters who use a simplex channel system that does not allow them to talk to each other across the county.

"The system we have is like two cans and a string," said Carper.

Carper says he felt like the county had little choice in going to the state's interoperable system because the state would not provide funding for anything else.

A telephone meeting has been set up between Carper and state officials for Friday morning, but Carper says state officials aren't able to meet in person until at least July 30th.

WSAZ.com contacted the Department of Military Affairs and Public Safety, but an e-mail requesting a return phone call was not immediately answered.

ORIGINAL STORY: 7/10/08

CHARLESTON, W.Va. (WSAZ) -- Reports say that the same multi-million dollar digital radio system that West Virginia is currently implementing could fail during emergency situations. One post-incident report out of Virginia claims the failure of the radios contributed to a firefighter's death. The concerns have some in Kanawha County taking proactive measures to make sure that doesn't happen here.

Kanawha County Emergency Operations Center Coordinator, Dave Erwin, tells WSAZ.com that the county is aware of reports of radio problems in other states that use the same Motorola P25 digital system that West Virginia has in place. Those reports mostly pertain to the inability to hear radio transmissions in high-noise environments, and radios receiving "out of range" signals when inside buildings.

The national reports are making their rounds with concerned firefighters in the Kanawha Valley, although not everyone is included in the discussion. One of those not in the loop is the president of Kanawha County's Metro 911 Board. Kent Carper tells WSAZ.com he is not aware of any issues with the digital radios nationally. Still, Erwin says the 911 center is working on the issue.

Digital Radio Studies and Reports

The International Association of Fire Chiefs (IAFC) recently studied the differences between analog and digital radio systems after departments brought their concerns to the organization.

In its interim report dated May 2008, the IAFC found that analog communication was more intelligible than digital in 6 of 9 high-noise environment tests. It has come up with a "best practices" guide for users of digital radios and is working to develop audio-intelligibility standards. ([read the report here](#))

Without a current standard in place, the IAFC came up with this desired outcome for digital radios:

"Analog voice intelligibility quality or better in digital radios, particularly in those areas tested where firefighter communication is paramount to their survival."

MRT, a Mobile Radio Technology publication, reported that the Prince William County Department of Fire and Rescue in Woodbridge, Virginia, released a report that claims problems associated with the county's digital radio system contributed to the death of one of its firefighters. ([read the article here](#))

And in Indianapolis, Indiana, TheIndyChannel.com has reported that that firefighters have questioned the safety of the their digital radio system, and have asked the county to delay their switch from analog to digital. ([read the story here](#))

Kanawha County's Digital Radios

Erwin says the technology in the radios that recognizes and converts a person's analog voice into a digital signal hasn't been perfected yet, but he says the state has been lobbying radio manufacturers to come up with a fix.

"I feel the manufacturers are working hard," said Erwin, who also sits on the state's Interoperable Working Group, the organization that oversees the statewide radio network.

High noise environments are common for firefighters, who often use saws, pumps, fans, and generators while working at emergency situations.

It's a matter of the radio manufacturers writing new software for the radios and then uploading it to each radio, says Erwin. One company, EF Johnson, claims to have a fix for the high-noise issue, but Erwin says he wants to see how it does in field tests.

Only three radio manufacturer's radios are currently permitted on the state's network: Motorola, EF Johnson, and Kenwood. Erwin says he's confident that once one comes out with a solution, the others will quickly follow.

He says despite these concerns from departments in other states, tests completed by the city and county show the new radios did "as good as, if not better than, the current analog system." Erwin added that the clarity of the digital radios is a significant improvement over analog.

So, on July 1, 2008, the Charleston Fire Department switched over to the digital radios. The only other agency that had been solely using this system in Kanawha County up until this point was the Charleston Police Department Traffic Division.

"The benefits of the new radios far outweighed the risk," said Erwin.

Erwin says he and the fire department were aware of the issues, but they conducted their own tests of the radios in a high-noise environment – and found that there was little difference between analog and digital.

Assistant Charleston Fire Chief Steve McClure says converting to digital has been a 5-6 year process – and all of the department's concerns were addressed during testing. However, he said they're able to switch back to the old system in a matter of minutes, if necessary.

"We're still on a learning curve," said McClure.

The radios actually work better for building penetration, according to Erwin. He said that while the analog radios had no coverage inside the Diamond Building on Capitol Street, the new radios work everywhere inside the building except in a metal elevator shaft. Similar coverage differences are seen in the state capitol complex, too, according to Erwin.

McClure also says the benefits of the new system far outweigh the cons, but he understands the concerns of others.

"Anything new is going to be met with resistance," said McClure.

The other alleged problem with the radios is the "out of range" indicator.

Erwin says he has a workaround for Kanawha County that will ensure that emergency crews will be able to communicate with each other while at the scene of an incident. He is in the process of applying for low power licenses through the FCC to add analog mobile-to-mobile channels to each radio. This means that once crews are at the scene, the radios will not need to communicate with the tower in order to transmit or receive radio signals. Communication to and from dispatchers will still be handled through the digital system, says Erwin.

He said he's applying for 10 frequencies to be shared between police, fire, and EMS, and expects it to be rolled out within six months. The cost of each license is \$700.

Erwin, however, considers this a temporary measure until all of the bugs are worked out.

He estimates the county will be fully digital within 3-5 years.

Local Firefighter Concerns

A 23-year veteran of the Sissonville Volunteer Fire Department, Tom Miller, says the digital trunked system that the state of West Virginia is rolling out was never designed for everyday use.

"It was designed for inter-agency communication during federal emergency levels three, four, or five," said Miller. "I have a problem switching over to a system not made for day-to-day operations."

Miller says there are too many unknowns and red flags raised about the digital radio system to be proceeding with further implementation.

When informed about the county's plan to use analog channels as a solution to one of the problems, he admitted it would help, but insisted that a workaround was just covering up a problem with the radios.

"I don't want to find out it doesn't work while on an emergency," said Miller.

Miller says he counts five firefighter deaths in the United States linked to digital radio problems.

"Do we want the sixth to be in Kanawha County?" said Miller. "I am greatly concerned for the safety of firefighters and emergency personnel in Kanawha County."

Why Digital is Inevitable

Erwin says two things have contributed to the start of a digital statewide radio system: 9/11 and FCC

bandwidth allocations.

For 9/11, he says firefighters and police officers in New York were not able to talk to each other on the radios when two planes crashed into the World Trade Center. The new system will allow any agency anywhere in the state to communicate with any other agency anywhere else in the state.

Erwin says the FCC is mandating that radio signals take up less bandwidth, or space, by the year 2013. While analog signals are able to transmit at the new restriction, he says any other further constriction is not possible with analog -- but is possible with digital.

WV's Interoperable Radio System

Governor Joe Manchin announced the statewide radio project publicly at a news conference on December 20, 2006. The system consists of tower sites around the state that are linked together and allow any emergency personnel with a radio to contact any other agency in the state without any other special equipment. The towers are linked via microwave radio signals.

Erwin says the main server for the system is in Harrison County. This means each time any user in the state presses the talk button, their radio communicates to the central system in Harrison County, where the server assigns the radio a frequency and gives it clearance to transmit. This happens in a split second. He says there is a backup to this server in Kanawha County.

This setup is referred to as a trunk system. The concept of such a configuration has a set number of frequencies and assumes that not every agency using the system will transmit at the same time. Each agency doesn't have its own assigned, dedicated frequency like they do in the analog world. Instead, the system dynamically assigns a radio to a particular frequency every time a radio user presses the talk button.

The main benefits for agencies to move to this new system are: inter-agency communication and towers that are maintained by the state. Up until this point, each agency has had to service its own radio equipment, according to Erwin.

"It certainly benefits everyone to be able to talk to each other, especially during emergency situations," said Joe Thornton, Deputy Secretary for the West Virginia Department of Military Affairs and Public Safety.

Thornton didn't immediately know of any mandates requiring local agencies to switch over to the state's interoperable system. Although, he said he believes there would be no issues with day-to-day operations on the system.

"I think it is important to stress our commitment and goal of ensuring emergency situations have effective and seamless communications and an interoperable system, while not flawless, certainly assists first responders and emergency officials statewide and across state borders with the ability to communicate in crises situations," said Thornton. "Communications is critical to the success of any and all operations and we certainly have no desire to implement a system that puts anybody's life in danger. Continued dialogue among all parties remains necessary as we move forward with the state's interoperable efforts."

Financially, digital radios cost nearly three times more than analog. That's been one of the biggest complaints about the system, according to Erwin. He says many volunteer firefighters have purchased their own analog radios for about \$800, compared to at least \$2,000 for digital.

A federal grant paid for each fire department in the county to have at least one radio, says Erwin. Future grants are expected to help provide more radios to emergency responders.

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