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Fire chiefs question new digital radio system

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Millions of dollars in new digital radios for emergency crews are making it harder, if not impossible, for firefighters to hear one another when their lives are most in danger, fire officials say.

Marion County emergency communications officials say they are confident the digital radios are an upgrade over the older analog technology now in use and began switching to digital this week. But fire chiefs in the area have written a letter urging the Metropolitan Emergency Communications Agency to allow them to use analog radios when they have to send firefighters into burning buildings.

The digital radios let firefighters communicate over wider areas, but their air masks and personal emergency alarms used during a fire make digital transmission of their voices unintelligible, a new federal study has found.

“Our worst-case scenario would be a firefighter is in there, gets lost or trapped, and as we’re trying to rescue him, he gets low on air and his alarm goes off,” said Boise (Idaho) Fire Department Capt. Paul Roberts, who was involved in testing for the study. “We’re no longer able to effectively communicate where he’s at or where he thinks he’s at.”

While one of the leading manufacturers of the radios is downplaying the issue, Plainfield Fire Department has decided to stay with analog, at least for now. Two other counties in the metro area, Hamilton and Johnson, have held off as they study the issue.

MECA began shifting some fire stations to its \$37 million digital communication system Tuesday. Its transition from analog is expected to be completed by early July.

Because of analog’s limited reach in parts of Marion County, MECA spokeswoman Jo Lynn Garing said, the benefits of digital coverage far outweigh potential issues. “We wouldn’t put in a system we felt was endangering people,” she said. “We feel this is the best system on the market.”

Marion County Director of Public Safety Scott Newman said MECA is looking into how it might be able to accommodate the fire chiefs but has yet to determine its best approach and what the costs might be.

Options include setting aside a backup frequency using analog or, in a more costly move, integrating analog with the digital system.

The chiefs want to be able to use analog at fire scenes and digital for other communication needs.

“We understand that we had to move forward with digital radios, but through training we’ve done in departments, we feel there is a safety issue,” said Dale Henson, head of the Marion County Fire Chiefs Association.

When the county first planned its system five years ago, the digital issues weren’t apparent. But as cities across the country switched to digital, concerns were raised and several, including Boise and

Orlando, Fla., have put their digital systems on hold. Phoenix has moved ahead with a \$120-million digital system, but its fire department is not included.

Background noises interfere

Digital radios transmit through a device called a vocoder, which compresses the signal digitally by picking out the voice from background noises and transmitting just that sound wave.

In normal communication, this isn't an issue. But in firefighting situations, background noises can overpower a firefighter's voice, causing the vocoder to transmit the noise instead.

Two life-saving alarms that firefighters rely on — one that vibrates in the mask and another that sounds a loud alert — cause similar interference with the digital radios that make communication unintelligible.

While it can also be difficult in those circumstances for fire crews to hear one another clearly using analog, words are still decipherable.

"In analog, as the signal degenerates, your mind can still process the info coming in and fill in the blanks," said Roberts, a member of the International Association of Fire Chiefs Digital Problem Working Group. "With digital, the blanks to fill in aren't even there."

The National Telecommunications and Information Administration study compared digital and analog radios in nine situations. The testing played a radio transmission for listeners surrounded by 80 to 90 decibels of noise, comparable to an idling fire truck.

In four of the nine tests done, including two in which alarms were activated, analog outperformed digital.

Neither signal was intelligible in another four tests. In the ninth test, analog and digital performed equally.

The International Association of Fire Chiefs has developed guidelines for using digital radios. Its recommendations include holding the radio microphone 1 to 2 inches from the user's mouth and shielding the microphone from loud noise sources.

Digital radio maker Motorola, which participated in the study, said it's premature to draw conclusions from the testing.

Plainfield Fire Department Capt. Ashley Strickland, who participated in testing with the international fire chiefs' digital group, said the situations tested were designed with the worst-case emergencies in mind.

In most everyday situations, both digital and analog work fine, he said. But when a firefighter's alarms go off, the inability to communicate can become a potentially dangerous, if not deadly, problem.

Analog system has issues

Analog has its own drawbacks.

The existing system has "dead spots": about 5 percent of Marion County where the radios do not work. In several places, including Downtown Indianapolis, the system is unreliable.

The new digital system will add six transmission towers, improving the coverage area to 99.5 percent and eliminating Downtown coverage issues, according to MECA's testing.

Another issue with the current analog system is its age: At 16 years old, it's becoming too antiquated

to be repaired.

The Federal Communications Commission also has pushed for public safety agencies to move to digital to free up bandwidth for additional government and commercial uses. The FCC has plans for a national digital broadband network that would connect all public safety emergency communication systems.

System delayed twice

Planning for the digital system in Marion County began five years ago, long before the garbling problem was discovered.

While Marion County is moving forward in its transition, the move to digital was delayed twice: first in April because of software issues, then in May after the fire chiefs raised their concerns.

MECA, in a Monday newsletter, said it would be “actively monitoring this situation and will do everything it can to ensure the new system provides the highest level of safety for our first responders.”

Newman said that at this point, MECA hasn't determined whether it will keep part of its analog system for firefighters. MECA's next boarding meeting is Wednesday.

Henson said the Marion County Fire Chiefs Association has not formally heard from the agency.

“It's a problem; we've been on a different page as far as whether we should cut over (to digital),” said Indianapolis Interim Fire Chief Brian Sanford. “We want this to be successful and safe and make sure we're doing the right thing.”
