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Talk Fast

Wildfire, Sept 1, 2005

Byline: Joel Greenberg

Friday afternoon and trouble was brewing. Just on the other side of Table Mountain where the Coors Brewing Co. is located in Golden, Colo., a fire was getting under way. Started by teenagers playing with fireworks, the tinderbox conditions of July 27 helped it grow and spread over 200 acres in just over three hours.

As firefighters are all taught, the first lesson in fighting wildfires is to mount a quick initial attack to beat back that potential. The second lesson, however, usually comes at the expense of the first. Getting responding firefighters from multiple agencies into the field as soon as possible can quickly snowball into a patchwork of different radio systems that can leave teams cut off from one another and the incident commander, despite all efforts to the contrary. As more departments are brought in, the radio interoperability problem can grow Medusa-like, creating chaotic conditions that severely compromise both firefighter and public safety as well as effective resource management.

This problem wasn't lost on Chuck Duey of the Jefferson County, Colo., Type-3 Incident Management Team. Duey knows that fighting the fire is always the initial focus with providing for communications often the afterthought, making radio interoperability one of the top recurring problems in the life of any firefighter.

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As communications unit leader on the North Table Mountain Fire, Duey faced the possibility of having 12 different responding agencies with five different radio systems in the field. But he was able to provide communications across all 180 firefighters despite the incompatible radios, frequencies and channels being used. The key to the puzzle was a device that provided Swiss Army knife - like utility for field interoperability, providing the functionality, ease of use and reliability for just that type of challenge.

COMMUNICATIONS PATCHWORK

Just in Jefferson County alone the mix includes an 800MHz digital trunked radio system, 800MHz analog conventional and trunked radios, UHF, VHF, and low-band radios. Add to that an Amateur Radio Emergency Services group that provides technical and logistical support, and the communications picture becomes ever more complicated with the arrival of each mutual aid resource.

"An initial attack can be chaotic, where you have lots of people coming in and forgetting they have to talk," says Duey, who as a certified communications unit leader is brought in on fires nationally.

At the North Table Mountain Fire, the Fairmount Fire Department was the local incident commander, using its VHF system for initial attack. But as other departments arrived, such as Coal Creek Canyon Fire Department (using the state 800MHz digital system), Arvada Fire Department (UHF), and Wheat Ridge Fire Department (800MHz analog), it would have been nearly impossible to get them all to talk and work together unless they checked into the Incident Communications Center and received an incident radio, which is how all large project fires are typically handled. For countywide resource management, Fairmont also needed to be connected to Jefferson County's 800MHz digital trunked system.

Of course, most departments coordinate their mutual aid efforts to include joint interoperability channels or common radio platforms. And despite a concerted effort by Colorado to bring all public safety agencies within the state's 800MHz digital trunked radio system, most mountain fire departments are choosing to keep on using VHF and UHF frequencies for the superior signal propagation over varied terrain and the compatibility with wildland firefighting communications gear sent out from the National Incident Radio Support Cache.

Even as 800MHz digital trunked systems become more widely installed to address interoperability issues, the problems posed by the wildfire environment remain unsolved. In hilly, mountainous terrain, digital signals too frequently break up, degrading the audio.

"In good circumstances, a digital 800MHz system works very well and offers lots of neat capabilities," says Duey, "but when things start getting sketchy, the human ear can pick up speech much better on

analog than digital." For that reason he typically likes to run everything on VHF analog, where the nuances of voice hold up much better under degraded conditions.

PRE-CACHE ARRIVAL

That VHF analog radios work better in wildfires is why the National Interagency Fire Cache has them stored in bulk for just such events. But even caches aren't the most practical approach if they're not available at the time and place when an initial attack is under way, as was the case at North Table Mountain. When firefighters are coming in fast and furious, the focus is on getting to the fire staging area and receiving an assignment, not waiting for communications equipment to arrive.

With the fire getting very active, the leader of Jefferson County's emergency operations center needed to patch together the Fairmount VHF and county 800MHz systems. The dispatchers didn't have the ability on their panels to bridge those two frequencies together, but Duey had the tool for the job.

He was able to establish near-immediate interoperability by linking the departments together using the "Incident Commanders' Radio Interface," a small, portable product that specializes in quick, on-the-scene deployment for connecting voice communications among normally incompatible radios and platforms, all without the need for a skilled technician. By cabling one of each type of radio to the ICRI, Duey easily created the connection between all participating agencies in minutes.

With an operation no more complicated than flipping toggle switches to create or mute different talk groups, the ICRI (equipped with either a telephone interface or command handset) interconnects essentially all types of portable and mobile radios, as well as direct-connect and cell phones. By mating a radio used by each agency or department to the ICRI, communications can be grouped or mixed according to who needs to speak to whom.

The unit isn't limited to interoperability. A strategically placed ICRI can double as a repeater for extending radio signals over longer distances, and with a cable reel extension it can be dropped into canyons, ravines or caves for search-and-rescue operations.

At 207 acres, the North Table Mountain Fire certainly wasn't huge, but that may be partially explained by the expedited response allowed by the ICRI. When the fire was very active, incoming units equipped with different radios were able to go straight to the incident staging area for assignment, without the standard practice of going first to a communications check-in area to be issued a VHF radio. The added benefit is that each responding unit can use familiar department-issued equipment.

"The ICRI is particularly effective for initial attack, when different agencies are arriving and you don't have the radio cache resources then and there to swap out for what they're using at the time." Duey says. "If itsgoes to extended attack, we can then use the cache of 80 preprogrammed VHF analog radio."

IMPROVED SAFETY

When teams are cut off from communications with central command, it doesn't just hamper coordination, it significantly increases the risks to firefighters and other responders. For example, an impending heavy air tanker drop was about to take place over an area with energized high-tension power lines. The ICRI allowed Duey to communicate with and move the firefighters in the targeted area out of the way of the drop, a potentially fatal scenario for those underneath the power lines where the drop would have created an electrical arc to the ground.

"Interoperability isn't just a nice-to-have, it's for the safety of the people involved. Without communications, they don't have the situational awareness and you don't want them out there," he says.

In this case it was better to patch together the various initial-attack resources' radio channels and let it play out until the next operational period, rather than risk people running radios out in the field. Duey says that going from an initial to extended attack is best done when there's a good transition point, like overnight when the deployment starts again next morning.

After about 30 hours, the North Table Mountain Fire was put to rest and wrapped up - a successful lesson in both initial attack and interoperability.

Joel Greenberg writes about public safety, firefighting and homeland security issues.