Giving notice

Dec 1, 2007 12:00 PM, By Annie Gentile

A gasoline tanker crashes and bursts into flames. Prevailing winds carry the noxious smoke into a residential area. Within minutes, commuters in the vicinity of the accident are alerted on their car radios to take a different route, and residents within a targeted radius of the incident are advised on their cellular and land-line phones to seek shelter indoors until the cloud passes.

From severe weather warnings to terror attack alerts, newer and more sophisticated technologies are helping local officials quickly and accurately notify residents about events in their communities. While warning messages typically are generated by government agencies, the systems that distribute the information often are owned and operated by private entities. So, the dissemination of information can require public/private collaboration with the shared goal of reducing losses, increasing response times and, ultimately, saving lives.

Behavior guides technology

Warning systems are only effective if the information is accurate and the public takes the appropriate actions. A turning point in research and development of effective emergency notification systems (ENS) and for emergency officials in guiding their development came in November 2000 when the Washington-based National Science and Technology Council (NSTC) released the report “Effective Disaster Warnings.” “A major finding [of the report] was that people don't tend to act on a single warning,” says Art Botterell, community warning system manager for Contra Costa County, Calif. For example, a loud noise that sounds like a gunshot could just as easily be a backfiring car, but it will get the attention of residents long enough to look out their windows. If they do not observe any corroborating visual warning, most will ignore the sound, he says.

Using key findings from the report, Contra Costa County created an integrated public warning system with a variety of corroborative messages. To begin, the county installed 42 outdoor sirens clustered mostly around refineries and petrochemical plants, and it distributed hundreds of weather radios to nursing homes, day care centers and schools. It also implemented a telephone notification system by Morristown, N.J.-based Honeywell International that uses electronic mapping and an automatic dialing system to call phone numbers in targeted areas to deliver pre-recorded alerts. The system was recently used to contact residents within a 1.5-mile radius of where a missing Alzheimer's patient was last seen. The county also can alert residents on pagers, by e-mails or pop-ups on desktop computers. Recently, the county began adding a cellular alerting system. The county's strategy has been to employ several methods of public notification so warnings are both received and heeded.

Such broadcasts must use common alerting protocols with a “write-it-once” program that triggers the various alerting systems so that warning messages are accurate and consistent, Botterell says. Contra Costa County's budget for its notification systems is about $1.2 million per year, much of which is funded by refineries and other industries that handle hazardous materials. With a county population of about 1.2 million, that spending equates to about $1 per person per year, Botterell says.

Any effective mass notification system must account for the unique attributes of the area it serves. Densely populated and home to the Pentagon and 30 to 40 other federal agencies, Arlington County, Va., brought together commercial interests and academia to develop a layered system that can communicate warnings to those who live and work in the area as well as to its thousands of visitors. “By doing it right the first time, we hope to be a model for the rest of the country,” says Dave Jordan, chief information security officer for Arlington County.

Doing it right has been an evolution, he says, beginning with a mass notification system from locally based Roam Secure that sends text alerts to desktop computers, cell phones and personal digital assistants. Billboards placed in strategic areas throughout the county advise the public how to program their cell phones

to enroll in the system and receive the free alerts. “It's a great tool to reach people who don't live here and will help to reduce chaos if we have a major incident,” Jordan says.

To supplement that system, in October 2006, the county launched an AM radio system that interrupts cable programming in case of an emergency. And, this past spring and summer, the county rolled out an outdoor loudspeaker warning system by Sarasota, Fla.-based Cooper Notification that is mounted on utility poles and can deliver pre-recorded emergency messages that are intelligible up to a half mile away. County officials are working to tie the mass notification programs into one computerized text system with a drop-down selection list so emergency management officials can easily choose which elements of the system they want to use, Jordan says.

The NSTC report also found that warnings are most effective when they are delivered specifically to the people at risk. The study determined that if people who are not at risk receive warnings that are not followed by the anticipated event, they are much less likely to take seriously future warnings. That concern was one reason why Spartanburg County, S.C., chose Web-based mapping software by Troy, N.Y.-based MapInfo and services by Baton Rouge, La.-based FirstCall Network to send emergency alerts to residents and businesses only in designated areas. The messages are relayed from the county's emergency operation center to the FirstCall phone network operation center in Baton Rouge.

At the same time, local officials select an area to send messages to as many as 500 land-line and wireless phones per minute. The system proved useful recently after an explosion at a local industry, and emergency management officials pinpointed the affected area and notified residents to shut off their heating and air conditioning and to move to a safe place.

Although the automated calls originate from outside the county, the system generates a Spartanburg County caller ID, which greatly increases chances of residents picking up their phones, says Community Emergency Response Team Coordinator Robbie Swofford. And, the system connects to two additional network operation centers in Philadelphia and Las Vegas, so county officials do not have to worry that an electrical grid blackout in Baton Rouge would affect their ability to notify their residents of an emergency.

Simple technology still works

With tornadoes, severe storms and floods generating seven Presidential-declared emergencies in the past year alone, Oklahoma officials have an arsenal of tools to deal with natural emergencies, says Oklahoma Emergency Management Office Public Information Officer (PIO) Michelann Ooten. While many sophisticated technologies are being used to notify residents of a problem, the older low-tech items still belong in every standard emergency kit, Ooten says.

Oklahoma officials encourage residents to have National Oceanic and Atmospheric Administration (NOAA) all-hazards weather radios in their homes, especially during tornado season. The National Weather Service (NWS) produces the broadcasts only for the radios, which can be purchased in retail outlets for $25 to $45. Some NOAA radios are designed to turn on automatically when NWS warning information is being transmitted.

The all-weather radios came in handy this past January, Ooten says, when a record number of people went to local hospitals suffering from symptoms of carbon monoxide poisoning. With electricity out for days, many people were running generators inside their homes and becoming sick from the fumes. “We were able to get on the weather radio and put out a public service announcement that described the symptoms of carbon monoxide poisoning and what people should do if they see the signs,” Ooten says.

Having little experience with hurricanes or tornadoes, residents of northeastern communities face ice storms and floods that can cripple them. When the Local Emergency Planning Committee (LEPC) for the small suburban community of Sharon, Mass., began looking for an ENS system, they realized they had to communicate with the public despite down phone and power lines.

The need for a non-wire-based notification system led them to radio, says Chuck Levine, training officer for Sharon Civil Defense, the lead LEPC organization. The committee purchased a Highway Advisory Radio

(HAR) system from Bloomingdale, Ind.-based Quixote Transportation Technologies and installed it in the town's emergency operations center.

Most communities with HAR systems use them for traffic advisories only, Levine says, so the challenge for Sharon was to increase public awareness of the system so residents would know to tune in during emergencies. Sharon officials began by using the HAR system for daily broadcasts of community information, such as town meetings, local tax deadlines, scheduled road construction and various civic activities.

With only about a five-mile radius, the town is planning on purchasing a second transmitter to shore up communications to some parts of town where the signal remains weak. So far, Levine says, town officials are pleased with the results. More people are tuning in to the station and getting emergency notices, and the local police dispatcher has been fielding fewer calls for advisory information during bad weather.

Emergency notification's future

As people become aware of an increasing number of hazards, their expectations for warning notification rise. “The challenge of public warning is not going to go away,” Botterell says.

At the same time, he says, government officials are afraid of the economic, political and career fallout that can happen when they take ownership of warning responsibilities. Once the act of warning becomes a statutory obligation rather than a discretionary act, there is liability, Botterell says. So, without a coherent framework of responsibility, an easy way out is to simply do nothing.

With that in mind, Botterell says the next step is to create integrated, all-hazard warning systems with established best practices so decisions are not left to judgment calls. “At the end of the day you have to be governed by wanting to do the right thing,” Ooten says.

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