FIRST RESPONDER COMMUNICATIONS:
Technology Aids in the Rescue
THE FIRST RESPONSE

Acts of terrorism, tornados, earthquakes, hurricanes, major fires and floods are all examples of emergencies. Just the mention of them can quicken your heart rate.

Firefighters, ambulance workers, police offers, search and rescue teams, and community emergency response teams are all first responders. And the mention of these professionals has a reassuring effect. While they may not be able to prevent a disaster from happening, their actions can help contain it and reduce damages, injuries, and loss of life.

These actions include knowing how to work with other professionals from different agencies and jurisdictions—while under the pressure of complex emergency scenarios. Communication to, from, and between them plays a large role in how effective the emergency response is.

In 1970, wildfires destroyed over 600,000 acres, damaged or demolished over 2,000 homes, and caused four deaths in California during a three month period. An examination of the events and involvement of the local, rural, metropolitan, state and federal emergency responders who helped battle the blazes led to the establishment of the FIRESCOPE Program in 1972. The resulting report, reviewed by the Federal government, cited inefficient communication during the fires as a major impediment to their efforts.

FIRESCOPE prompted the U.S. Department of Homeland Security to develop the Incident Command System (ICS), a tool to help manage all emergency resources. ICS covers Operations (fire, police, and medical), Planning, Logistics and Administration to make sure everyone is working together as a unified team.

While this gives emergency planners insight on how a multifaceted disaster should be handled, there is still no universal playbook for emergency communications: who gets called, who goes where and who does what. And how all agencies should interact with each other. ICS notes issues with chain of command, interoperability, use of available technology, planning, information sharing and common terminology between agencies as hindering first responder communications. The reality is a crisis never plays out by the book. Especially in complicated situations where multiple teams are involved…and where infrastructure and normal modes of communications may be affected.

Optimal communication between first responders involves preparation and processes—an ounce of prevention, so to speak. It also requires technology to facilitate essential functions like notification, deployment and tracking.

What can tip the scales in terms of a well handled vs. an inefficiently handled emergency? Let’s look at some major issues with first responder emergency communications and how innovative technology can not only support smart planning and processes, but aid in the rescue.

---


COMMUNICATION ISSUE #1: INTEROPERABILITY AND CHAIN OF COMMAND

“Effective emergency management and incident response activities rely on flexible communications, and information systems that provide a common operating picture to emergency management/response personnel and their affiliated organizations…Incident communications are facilitated through the development and use of common communications plans and interoperable communications equipment, processes, standards and architectures. During an incident, this integrated approach links the operational and support units of the various organizations to maintain communications connectivity and situational awareness.” -- Federal Emergency Management Agency (FEMA)³

The degree of interoperability, or how diverse systems and organizations work together, comes up in almost any discussion regarding the methods first responders use to communicate during an emergency. During the terrorist attacks of 9/11, communications between personnel from different departments were strained as they used different frequencies and protocols.⁴ Without integrating inter-agency requirements, teams can end up working at cross purposes and break the chain of command.

The ICS report found “lack of accountability, including unclear chains of command and supervision” to be a major obstacle to communications and continuity of operations. If the scope of an emergency remains local and only involves area first responders who have likely worked in tandem before, it is much easier to communicate. Chain of command increases in complexity in proportion to the complexity of the emergency, especially when different jurisdictions (including national, state/provincial and local governments) are involved. This is especially true when it comes to coordination between professional first responders and volunteer Community Emergency Response Teams (CERT), who do not have the same level of training or experience. Even urban and rural emergencies have different characteristics. In rural areas, fewer people may be affected, but there are also usually fewer resources and communications networks/capabilities. Without a clearly defined chain of command and responsibilities, or if individuals choose to sidestep the chain, overlap and confusion may occur.

If multiple agencies and/or jurisdictions are involved, the nature of the emergency determines who takes the lead role and who plays a supporting role. Generally speaking, however, a crisis is led by the Incident Commander(s)—either an individual (Single Command) or two or more people (Unified Command) for larger incidents with more teams involved. ICS protocol requires all responders to check-in and follow Unity of Command, where each first responder is assigned to only one supervisor who, in turn, must be able to communicate with and manage all those they supervise (as illustrated in the following organizational chart).


Accountability is the cornerstone of an effective chain of command. ICS explains, "The principles clarify reporting relationships and eliminate confusion caused by multiple conflicting directives. Incident managers at all levels must be able to control the actions of all personnel under their supervision." An organizational chart helps to clarify reporting structures, but it is the "how" of communication where things can get difficult. This is where technology can come to the rescue.

**Unity of Command/Interoperable Notification**

To achieve unity of command, incident commanders and supervisors must to be able to clearly communicate with their direct team. While hand held radios or walkie-talkies are a common device used in emergency scenarios, during a complex incident with many agencies involved, radio communications can be limited and different signals can cause confusion and isolate first responders. An array of technologies, equipment types and spectrum bands are used by various agencies, making communication between agencies difficult during times of crisis. Alternatively, they may be asked to carry multiple radios or relay all communications through a dispatcher, which can be cumbersome and cause communication delays. Another option is to use national interoperability or mutual-aid channels, but with strict government usage guidelines in place, it is not always a viable option.

If messages need to get out across teams, a universal and more direct mechanism may be needed. Notification systems that can quickly and easily send general or targeted messages to large or small groups can be helpful in establishing unified command. If the system includes template functionality, then the time it takes to send a communication can be minimized. For example, entire jurisdictions or multi-agency teams can create templates, in advance, with pre-defined recipient groups (such as all responders or individual units). Some notification systems enable the dynamic creation of groups (message audience) by their role and/or location and/or any field in their profile—parameters that can be extremely useful during a crisis.

**Deployment**

Having sufficient first responders on the scene is a worry—but so is having too many. Not only can too many people on hand confuse the situation and lead to breakdowns in chain of command, but if the incident continues over a longer time frame, those surplus emergency personnel would be unavailable when they’re needed to relieve tired workers. How does a management team go about achieving the correct workforce balance, especially if multiple agencies are involved? An enterprise-class notification system can send first-to-respond messages to both professional and CERT first responders to quickly allocate workforce. The first-to-respond function notifies recipients from the database until the predetermined target number has, or required individuals have, confirmed their availability…and then stops.

Additionally, mapping functions can show which first responders are in a geographic area (such as a local fire hall or police department locations or even CERT home addresses) so team leaders can deploy resources located closer to the crisis, which can speed response.
**Tracking**

If handheld radios are not available, operational, or compatible then another communication mechanism may be necessary. This is where a universal call in number to retrieve global or unit specific status updates is useful. However, individual first responder safety and status updates (back to command) are just as important. Roll Call functionality found in notification systems enable first responders to call in and report their personal or situational status—allowing command to focus their attention on individuals who need assistance or who have not reported in.

Even if all team members do not need to be apprised of every change in status, the ICS states that supervisors must record and report resource status changes as they occur. This is where a web-enabled notification system that logs all notification and roll-call actions (even individual command or general staff comments) can provide assistance. It also makes transferring command easier as the next commander, or supervisor, can easily reference reports, activity logs, and comments to see what has happened prior to their arrival. By the same token, a virtual library available through protected web access can store documents that help with a transfer, such as chain of command organizational charts.

**COMMUNICATION ISSUE #2: INEFFICIENCY AND CONFLICTING TERMINOLOGY IN COMMUNICATION SYSTEMS**

ICS identified inefficient uses of available communications systems, conflicting codes and lack of knowledge with common terminology during an incident to be obstacles for first responders. As with chain of command, the more agencies involved, the greater the chance for inefficiency and “broken telephone” when relaying messages. It is essential to communicate using common terminology and clear language instead of agency-specific codes.

FEMA training suggests that incident management effectiveness is increased when all communications are in plain English and no radio codes, agency-specific codes, or jargon are used. Common terminology should be used to define Organizational Functions, Resource Descriptions (personnel, facilities, and equipment/supply items), and Incident Facilities and Position Titles (Officer, Chief, Director, Supervisor, or Leader).6

**COMMUNICATION TECHNOLOGY AIDS**

Technology can help make communication more efficient and consistent between first responders. First, as previously mentioned, is a unified messaging system for notification and deployment. Messages from a unified messaging system can be sent to various parties and response teams to alert them to changing conditions or deploy a first-to-respond campaign to assign workforce resources as

---

required. It provides a consistent, quick, and effective method of communication between commanders and emergency response teams.

Keeping terminology consistent among diverse agencies through access to a glossary of terms and other common documentation seems like a smart, simple solution. However, expecting individual first responders to carry a manual in the middle of a disaster isn’t realistic. A searchable online library of resources, including a glossary of terms (accessible via mobile devices) can help ensure all communication is understood.

COMMUNICATION ISSUE #3: BACKUP PLANNING

The best offense is a good defense. Another impediment to communications happens even before an emergency occurs: lack of planning for different types of crisis scenarios, including worst case. For example when cell phone networks go down, phone lines are bottlenecked, and the power goes out, all at the same time.

While this doesn’t happen frequently, within the context of a major crisis it is not uncommon. During Hurricane Katrina, New Orleans first responders experienced multiple communications failures. Even during many of the localized recent acts of violence, like the Fort Hood and Concordia University shootings, cell phone networks were overburdened.

More than the average citizen, first responders need to communicate with each other, while commanders also need to communicate with the public at large.

When emergency planning, government and first responder agencies need to review the technology and processes required to maintain essential communications continuity.

COMMUNICATION TECHNOLOGY AIDS

According to the Federal Communication Commission there should be “policies and protocols in place to ensure that all personnel have access to emergency notifications, via various communications devices.”

In first responder lingo? Backup. In emergency notification system lingo? Multimodal—a system with the ability to send notifications via email, SMS, phone (landline, mobile, or satellite), fax, pager, TTY or via the web with local and geographic redundancy.

The ICS also advises advance planning: "Developing an integrated voice and data communications system, including equipment, systems, and protocols, must occur prior to an incident." Part of forward thinking involves imagining different emergency scenarios and how the response team may need to communicate during them and with whom. Again, advanced notification technology incorporates templates that can be setup in advance in preparation for the types of emergencies an area is more likely to experience. For example, certain regions may be more prone to wildfires, floods or hurricanes. Templates allow for speedy, streamlined communications in the event of a crisis.

**COMMUNICATION ISSUE #4: RESEARCH, RECORDKEEPING, AND FOLLOW-UP**

Communication is not always verbal. Sometimes, written communication for first responders can be helpful…and necessary…during and after an incident.

Particularly in a larger-scale crisis where processes are more complex, being able to remotely access procedures, manuals, and even documents specifically related to the crisis, such as organizational structures and external resource contact lists, is invaluable.

In a Canadian study of emergency communications, "Respondents agreed that there is a very strong need for a range of services which would be offered through a centralized research facility: access to knowledge and expertise across the First Responder community…This signals strong support for the expanded mandate of the Canadian Police Research Centre (CPRC) to address the needs of the broader First Responder community."  

The ICS also cites the importance of analyzing and sharing information and intelligence. This necessitates the establishment of a process for potentially multiple agencies to gather, distribute, and manage incident-related information and intelligence. Topics can include national security and classified information, as well as operational information like risk assessments, weather information, geospatial data, as well as utilities and public works data.

---


Analysis of what is happening during an emergency—and/or reviewing this information afterwards is an essential part of crisis communications. FEMA training even requires incident recordkeeping: “All incidents require some form of recordkeeping. Requirements vary depending upon the agencies involved and the nature of the incident.”

**COMMUNICATION TECHNOLOGY AIDS**

For research during a crisis, storing documents in a virtual library, accessible via computer or mobile device browser, by geographically disperse first response teams is a smart use of technology. Advanced systems allow administrators to set permission-based access for groups, teams, or individuals to ensure confidential information is protected.

Notification systems can also generate status reports during an emergency, allow online collaboration and keep an audit trail of communications allowing first responders to provide full in-crisis and post-crisis reporting. These types of tracking mechanisms simplify management of processes by organizing and tracking events and provide detailed logging and reporting. After the situation has passed, not only can reports protect an organization from liability, but they also can be analyzed to see how processes could be improved in future crisis situations.

**COMMUNICATION ISSUE #5: PERSONAL COMMUNICATIONS**

Issues with first responder communications during a crisis extends beyond communication with each other. In an emergency that affects a large area—and potentially the families of first responders—concern for the safety of loved ones can get in the way of focusing on the job. Case in point? Families of Hurricane Katrina and 9/11 police and firefighters who worked around the clock—or perished—were literally in the dark as to their whereabouts for extended periods. Robert Lang, Assistant Vice President for Strategic Security and Safety at Kennesaw State University wrote, “Indeed, first responders might be concerned with ensuring the safety of their own families before being able to assist others. This happened during Hurricane Katrina; many police officers, fire fighters and emergency medical services personnel were involved themselves or were not able to respond due to blocked roads or flooding.”

**COMMUNICATION TECHNOLOGY AIDS**

The Federal Communications Commission suggests that organizations in charge of incident response develop and keep current employee contact lists that include office telephone numbers, work related mobile phone numbers, and email addresses. They also advise adding personal home and mobile telephone numbers as well as personal email addresses to the list.

---


However, notification systems that support many agencies within a single, or multiple, jurisdiction could make keeping the stakeholder database up-to-date time consuming. Systems with multiple ways to update stakeholder information such as .csv upload, integration with 3rd party software, self-registration, as well as giving first responders the ability to update their own profile information can reduce this burden from administrators.

Additionally, a notification system that provides individual first responders with the ability to maintain their own personal database of contacts, and send their own personal message to their contacts at the same time, allows the first-respond to give their loved-ones peace of mind.

COMMUNICATIONS SAFETY NET

Emergency responders are well trained. But no amount of training can fully prepare them for the complex crisis situations that often arise. Nor can teams be fully prepared to work with every possible combination of agency and jurisdiction that may be part of the response team during an incident.

They can, however, have the best communication technology and processes available to deploy, track, and notify each other effectively within a set chain of command.

While saving the lives of others, first responders often put their own lives on the line. With so much at stake, facilitating coordinated efforts through an integrated communications system is the best safety net for both the public…and for those who come to the rescue.
Contributor – Tim Bonno

Tim Bonno has 30+ years’ experience as a business continuity and disaster recovery professional. Tim has worked with many communities across the United States passionately promoting and training Community Emergency Response Teams (CERT). Tim is also the co-founder of the business continuity professional group “MidAmerica Contingency Planning Forum (MCPF)” in St. Louis, Missouri and currently serves as its President.

In addition to his own personal blog, Tim has written many business continuity and emergency management articles that have been published in notable trade journals. Tim also serves as the Training Lead, and a Ground Search member, of the Eureka Fire Protection District’s Search and Rescue Team.

About ERMS Corporation

ERMS Corporation is the provider of Advantage — a highly-secure, hosted, comprehensive, and enterprise-class emergency and incident notification system.

Made up of 7 tightly-integrated modules (Messenger, Roll Call, Crisis Manager, Mapper, HotLine, myAdvantage, and Library), Advantage provides the reliability, advanced functionality, and superior flexibility so organizations are able to adapt the system to suit their unique requirements.

Advantage is sold as a complete solution (the opposite of add-ons) and empowers business continuity, crisis communication, disaster recovery, and response teams to quickly and reliably prepare and execute notification campaigns – while gathering the auditable information required to prepare in-crisis and post-crisis reports.