# Getting the Right Information to the Right Place at the Right Time

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When a major disaster occurs, first responders cannot always rely on the existing communication infrastructure. More often than not, their systems are impaired in some way by the disaster, or the systems cannot support all the communication needs. Preparing for these infrequent but catastrophic instances is vital to a positive resolution. Not preparing is expensive in dollars and lives, and very embarrassing. The time to explore communication infrastructure is before the next disaster occurs.

A standard procedure after most any large incident is to conduct an objective AAR, After Action Review. Looking at large numbers of After Action Reports for medium to large scale incidents shows recurring themes. In the Communications and Information Management areas, the common recurring problem areas include:

. The need for Assured, Survivable, Secure Communications
. Issues of Interoperability Between Disparate Users
. Finding methods for more Rapid Restoration of Infrastructure/Comms
. A need for Increased Comms Capacity - Radio, Cellular, Network, Satellite
. The Lack of Situational Awareness

Getting the right information to the right responders and decision makers at the right time is the ultimate Information Management goal. Resolving the issues listed on a proactive basis requires a dedicated effort, but results in the best possible outcome for all involved. Each of the 5 issues listed above can be effectively addressed with planning and knowledge of suitable technologies.

## **Assured, Survivable, Secure Communications**

A major issue that must be faced in the very near future is the ability to provide communications into an effected area that is assured, survivable and secure. Communications systems are designed to provide adequate coverage for *typical or historical* situations within their operational area. As illustrated in the ValueJet crash in 1996, the September 11 events, and common natural disasters such as regional ice storms, failure of a communications system is often designed in due to capacity and budgetary constraints.

Consider one large western city, typical of many: Surrounded by suburbs, municipal communications during peak hours use more than 90% of the available bandwidth and “key down” time: All of their channels are in use more than 54 minutes every hour for what has become “routine” peak usage. When a medium scale event occur during peak usage, or a major event occurs at any time, this city simply cannot provide all the communications necessary for first responders to do their mission as efficiently as needed. Atypical as this city is immune from most weather issues, similar scenarios in the central, north or eastern part of the

US complicate when ice, heavy rains or winds compromise infrastructure, further reducing the ability to communicate.

When an incident does occur, the demand for bandwidth, both voice, data, imaging and collaborative, increased dramatically. The ability to provide a high quality picture of a relevant scene is now more related to a successful outcome. Numerous solutions exist which support this capability.

A common communications assurance problem is the reliance upon complex infrastructure for trunked radio systems. While clearly the most efficient in high density environments, additional problems arise with ice, earthquakes, vandalism, or even a moderately well thought out attack. By disabling, or at least overwhelming infrastructure at key points, ill-doers can easily compound, if not negate, rapid response times. Providing an assured level of communications in a reasonable time for these events is not difficult, but requires advanced planning, analysis and selection of appropriate assurance mechanisms, alternatives and overload systems.

Similar but different than assurance, communications survivability deals with the ability to communicate in any situation, primarily from HQ to incident scene and significant responders, either through primary, backup or alternative systems. Different from assurance, survivability works to insure the depth of communications exist for critical communications, and is often based upon a systems oriented design of multiple layers of communications options. Usually designed into an overall architecture, survivability can be enhanced by new technologies and the sharing of systems.

In contrast to making communications available, secure communications limits the transmission and reception of communications to authorized users, and has taken upon a new light for mass event responders. By providing a minimum level of security in at least one case, response times improved as scanner-philes no longer add to traffic woes in congested urban areas. Additionally, security helps to regulate the flow of sensitive information, which may cause mass or hysterical reactions, or might aid terrorist or criminal elements. When a mass event or attack occurs, the restriction of significant information to unauthorized recipients is crucial to prevent secondary effects, escape or the covering of significant evidence from even moderately sophisticated attackers. Security options now exist which allow compatibility between users of different media or otherwise incompatible equipment, while retaining secure end to end communications.

## Interoperability Between Disparate Users

Too often local, national and other relief groups arrive at the disaster scene with their own, albeit incompatible communications. Incompatibility of communication systems can be a life threatening issue. There are some relatively simple ways to achieve needed interoperability between all responders with disparate communications. One method uses a tactical switch. Born from sophisticated military communications, a tactical switch integrates multiple types of interfaces and media at the disaster site. This commercialized equipment provides a significant communication boost at a low cost, and utilizes existing communications equipment, regardless of compatibility.

Another proffered solution is APCO 25 and Tetra radio solutions. While these are long-term solutions, they are somewhat expensive and have a fairly long install cycle, but will provide an information transport mechanism supporting a variety of media types.

Another way to achieve Interoperability, and provide a simple layer of survivability, is to provide Cellular capability on site, commonly called Pico or Micro cellular systems. A lesson learned during the ValueJet crash in May 1996 was the overloading of the existing cellular system in the Everglades, a remote part of Florida. For many responders, the cellular system was the only system with coverage in this area. Many of the reporters and onlookers used their cellular telephones to call in reports. The cellular system was quickly overloaded and some legitimate responders were effectively 'locked out'.

The good news is small portable cellular systems can be put in the back of a vehicle and used to augment an existing system, or provide capability where no service currently exist. Microcell and Picocell systems can be programmed to allow anyone or only preprogrammed responders access, but the important aspect is they can be operational in a few minutes, augment existing capacity, and can be integrated into a total emergency communications system.

One of the areas that disaster communications directly benefited from the Desert War was "Rapidly Deployable Communications" system. These systems allow almost any telephonic, radio and network communications from any Coalition Force to be integrated together in a near seamless manner. When placed on an incident scene, incompatible radios, cellular, conventional and trunked systems become interoperable.

For example, a Fire Commander can talk directly to the Police Commander on scene using this technology, by literally "dialing his existing radio". He can also set up a conference call, connect to a disaster or materials expert, all with the addition of a single integrating element. He can also use this bridging capability to connect to other responders who have very low cost radios without keypads.

## Rapid Restoration of Infrastructure/Comms

A small amount of preparation can significantly augment the rapid restoration of damaged infrastructure and communications channels and facilities. Specialized rapid deploy communications payloads can be placed in the back of a small truck, a 4 wheel drive vehicle, or light aircraft. These can restore conventional, trunked, cellular, paging, imaging, Internet, satellite and other circuits within minutes of arrival at an incident. They can be open systems which allow any user to join, which may be helpful in remote areas where only first responders are likely, or they can be closed systems usable only by first responders or specific identified users. This would be more typical in dense urban areas where non-primary responders might accidentally use these communications assets. By planning your integration of different types of voice, data and images, your options and efficiency will go up, and your overall costs will go down.

The Internet Information is power, and the Internet is and will remain king of information, giving you options you didn't have before. It has set defacto standards that most media can or will shortly interface to. I f you haven't made plans for including the Internet in your next disaster, you need to ask why not.

On scene Internet access gives you:

. Direct access to you existing and supporting agencies online information resources
. Near Real Time Imaging of disaster or other significant areas
. Analysis, test data and a resulting Expert analysis of Structures in question
. Remote diagnostic of systems, buildings and conditions
. Alternative communications channels
. Multipoint Teleconferencing and Application sharing
. Real time weather conditions and forecasts
. Access to world class experts you can't get have on scene

## Increased Comms Capacity - Radio, Cellular, Network, Satellite

Related to rapid restoration is increased capacity. A major problem at most incident sites is the local responder radio channels, cellular capacity and other media are stretched to their limits, and often do not support the needed comms volume. Technology exist which can rapidly augment these services such that improved capacity and significantly fewer dropped calls and busy tones are received, aiding first responders in their mission.

## Situational Awareness

Situational Awareness or SA, is the most effective means for giving decision makers the best possible information in real time. It's many pieces of information, integrated together in an easy to absorb media. Depending upon the incident or event, SA engines combine multiple dissimilar information formats into a single picture with all the relevant information necessary for command and operational personnel to make intelligent informed decisions.

Common in military environments, SA can provide a realtime view of actual events as they take place, with relevant information overlaid in an easy to absorb format. In a mass casualty event, a single picture can show the status of triage, transport and hospitals, metrology, movement and dispersion of clouds, available resources, communications status and many other significant real time events while supporting voice and video conferencing.

In the event of terrorism, law enforcement and civil support benefit most from rapid assessment and action. SA is most effective to an incident where information is time critical.

## Conclusion

Cost effective solutions exist today to address the problems described. New technologies allow users to provide the communications they have in their office to any incident site, anywhere in the world, while providing the extra bandwidth, channels and informational support necessary for a successful outcome. Situational Awareness engines can provide a realtime status and operational capability decreasing congestion, improving information and operational flow, while minimizing the effort in a difficult tactical situation.