

Planning For The Next One: Maintaining Communications During Emergencies

A White Paper From



By Richard Kent and Harold Tepper

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Table of Contents:

Introduction

Ground Zero: Learning First Responders Lessons from Recent Emergencies

Enterprise Lessons from the First Phase of an Emergency

Characteristics of a Flexible Emergency Communications Solution

Day Two Communications Requirements for Recovering Communities

Restoration of Business Operations

Lightening the Cost Impact of Emergency Communications Systems

Conclusions

Introduction

Recent natural disasters as well as terrorist attacks have provided painful but valuable lessons with respect to disaster recovery and business continuity. Prior to these events, many people and organizations viewed disaster recovery and business continuity investments primarily as an expense, trying to minimize it wherever possible. These attitudes have changed dramatically after seeing the devastation that has occurred, the loss of life and economic impact – both short and long term – of these emergency situations. As a result, we have learned to expect the unexpected, raising the importance of disaster planning and preparation.

One of the most significant lessons learned is the critical nature of communications during the multiple stages of a disaster – from preparations for an approaching event, surviving the actual episode, addressing the immediate after-effects as well as rebuilding on a longer term basis. The breakdown of communications capabilities in these situations has become a life and death issue. This paper will take a look at recent emergency situations, highlight lessons learned and define communications requirements at the different stages in the process as well as defining an emergency communications architecture and set of required capabilities.

Ground Zero: Learning First Responders Lessons from Recent Emergencies

Recent natural disasters and man made emergencies; from the 9/11 terrorist attacks and terrorist bombings in the UK and Spain, to the many devastating hurricanes that occurred recently have caused us to take a critical look at the state of disaster and business continuity planning. While there are many possible dimensions that can be explored for valuable lessons (i.e. estimating emergency requirements during rapidly changing situations, clarity of roles and responsibilities, cutting through bureaucratic red-tape to achieve required speed and results) that can be learned from these recent events, one of the most critical areas that we have identified is that of communications preparedness. Making communications more effective during emergencies is always at the top of the list of initial post-mortem reviews, but is often then tucked away in reports without generating appropriate action for the next series of disasters.

In examining the lessons we can learn from the adequacy and effectiveness of the communications infrastructure preparedness during emergencies, a logical starting point is with First Responders. This is an area where, quite frankly, the general consensus assumed if any group would be prepared that this group would be – leveraging manpower, technology and the existing infrastructure to

rapidly and effectively respond. Unfortunately, this has proved to be far from the truth.

In the case of 9/11, we saw that the immediate and heroic response of the NYC Police and Fire departments was hindered by the failures of their communications systems. Although a Command Center was set-up at the site of the disaster, it did not ensure adequate communication and timely coordination of emergency site activity. Not only did the respective Police and Fire Department radio systems not perform adequately within their departments, but the systems did not enable communication between the Fire and Police Departments. Cross system communications proved difficult, and an inadequate allocation of bandwidth in the isolated systems led to overloading and breakdowns. A clear lesson emerging from the disaster was that first responder communications systems need to be available with adequate bandwidth and considerable interoperability.

While the occurrence of hurricanes making land in the southern US is certainly not a new or unexpected phenomenon, the recent arrivals of Katrina, Rita and Wilma demonstrated that communications planning and available systems also were inadequate during the early days of the events. Traditional assumptions had been that disasters would be a local phenomenon, and that the communications system infrastructure would remain operational at least in part, and that there would be a way for first responders such as the National Guard, Police, Fire, volunteer groups, and other governmental agencies to communicate, coordinate and respond. This proved to be a faulty assumption. In the case of Hurricane Katrina the devastation was so widespread that the communications infrastructure in the entire region was disrupted. Traditional land-based communication was disrupted when telephone company Central Offices went under water, cell towers were blown down, and both infrastructure systems and telephones ran out of power.

The massive scale of the devastation, including to the communications infrastructure, highlights the need for an expansion of best practice thinking. It requires planning and deployment of communications systems and capabilities that are redundant, interoperable, and mobile for rapid drop in replacement of downed systems. Taking a lesson from military communications planning, which assumes you can count on nothing and therefore have to bring your own, emergency responders must learn that they can not assume the existing infrastructure would be there for them to use. First responders must plan for and acquire in advance, truly mobile emergency communications backup systems -- systems that can be easily moved, self-powered and can accommodate multiple communication transport options that can take advantage of what channels are available. These communication channels might include landlines, data lines, microwave, radio, cellular, and satellite. During the devastation of Katrina, satellite communications capacity was one of the few remaining channels still operating. Yet, getting satellite access and being able to utilize these channels

to interoperate with other communication links had not been planned for or even contemplated.

The scale of destruction during Katrina also challenged assumptions about how many back-up systems might be required. While creating a plan for a command center location system has been well understood, the need for outlying locations handling emergency care and support functions has not traditionally been part of normal preparation.

Medical care providers also learned critical communications lessons from the impact of the hurricanes. When the standard operational model of hospitals providing the key hub of patient emergency care broke down, and as hospitals found themselves virtually shut down because of flooding and other damage, new models emerged for triage care. Impromptu field medical facilities became an important first line of care and required communications be established with each other as well as with surviving hospitals – seeking patient information, relaying patient conditions, numbers of injured, determining where patients are to be transported and coordinating the entire process. Clearly, emergency back-up communications systems for the medical teams were required. To more effectively operate in future emergencies, these communication systems would need to extend beyond terrestrial telecommunications and radio transmissions. While the utility companies have long been some of the best prepared for emergency responses, the hurricanes also severely tested their planning assumptions. The scale and severity of a Category 5 hurricane that covered multiple states when it hit land brought new lessons in planning for power recovery. Utility companies needed to establish multiple command centers in the field to coordinate the activities of their crews and have the ability to communicate with the HQ organization to relay manpower and equipment requirements and other critical information. Lack of adequate availability and access to multiple systems clearly slowed down their operations. Future preparations must increase the number of emergency systems to be able to respond to emergencies on a multi-state scale.

Enterprise Lessons during the First Phase of an Emergency

Communications capabilities are also essential and play a critical role for businesses in preparing for, dealing with, and recovering from emergencies and disasters. In any emergency, the ability to rapidly gather, synthesize and analyze information and requests coming from a broad range of sources is most critical. The communication process facilitates the coordination of response efforts and makes it possible to deploy strained resources effectively.

This was very clear to the oil companies on the Gulf Coast as they prepared for and dealt with the aftermath of Hurricane Katrina. Their first priority was to lock-

down their plants and equipment. This was a massive effort requiring constant dialogue between company personnel from headquarters to regional office to oil rigs and other plants. To accomplish this rapidly, conferencing capabilities are essential. Personnel needed the ability to schedule and execute a multitude of conference calls right up until the hurricane hit. There was also a need to establish impromptu conference calls to deal with issues and situations as they arise. As the hurricane grew nearer, broadcast capabilities – both voice and data – were required to give personnel up-to-the minute information on the status of the storm, what they should be doing, and most importantly when and where to evacuate to.

Part of the planning process needed to include making arrangements for employees to work remotely during the storm, to monitor the situation as well as afterwards to assess damage and begin the recovery phase of the operation as soon as possible. This proved difficult to accomplish when traditional communications were disrupted. Future requirements must expand the capability to use a wide range of communications channels including cellular, WiFi, Broadband, satellite service, etc. The ability to utilize IP telephones or soft phone software capability on a PC to connect to the company's network via the internet is also likely to become a baseline requirement.

When the storm actually hit, it was very important for personnel to be able to alert others as to specific crises that had to be dealt with in a rapid manner. In order to do that, people must be able to dial a pre-determined and programmed string of digits that signify an emergency. Once dialed, the system should have the capability of not only completing the call, but simultaneously alerting emergency personnel and first responders that a situation is in progress, who is involved and the location. Critical to an effective alerting system is its ability to provide confirmation and active response. The system must not only support multiple channels of alerting communications, i.e. telephone, email, pager etc., but support methods for remote personnel to confirm their notification and capability to respond as requested.

After the storm was over, the first priority was to locate employees and determine their status. This would only be feasible if plans had been made previously and people trained as to how the process would work. Key to this plan is to ensure that the company does not rely on one type of communication capability. In disaster situations, people will try to use whatever they have access to – most likely some type of mobile communications capability. Again, conferencing capability is crucial as employees can call into conference bridges at times that were previously defined. Broadcast capability is also crucial as instructions and orders can be easily and quickly disseminated. This capability is important in cases where people might be able to receive messages but not be able to originate them.

Once the immediate emergency has passed, the oil company needed to quickly coordinate with their suppliers – power, gas and telephone – to re-establish the core infrastructure that supported their operations. Concurrently, the company needed to coordinate their efforts to get the facilities back up and running. Communications capability that enables not only interfaces between the headquarters organizations, but between employees of the various organizations in the field was crucial to coordinating the restoration effort.

Characteristics of a Flexible Emergency Communications Solution

Our analysis of recent emergencies and disasters and the lessons that have been extracted have contributed to defining a generalized set of requirements for emergency communications solutions. Emergency communication solution requirements must start with capabilities that can be added to existing, fixed systems as well as extending to mobile, ready-to-deploy solutions. Emergency communications solutions must be inherently mobile in their physical portability and operational capability to be dropped into emergency sites. These systems must be ready to go, easy to set-up, and quickly connected to whatever communications channels are available in a broad range of situations and environments. A key to mobility is a small form factor so that a system can be moved to the location where it is needed in a light vehicle or even dropped to a site by helicopter. Additionally, an emergency communication system must have an un-interruptible power supply with battery backup so that it can continue to operate while starting up, changing over to, or refueling local generators.

Emergency communications solutions must also be flexible and adaptable – with the ability to utilize and interconnect to traditional land lines, cellular, wireless/WiFi, radio, satellite uplink or any appropriate combination of services, depending on what is available and the specific needs of the situation. Flexibility also means being able to switch from one means of transport to another, taking into consideration cost as well as current availability of service.

Audio conferencing capabilities are another important requirement in an emergency as actions must be coordinated and quick decisions made based upon input from many sources. One aspect of this enables groups of people to call-in to conference bridges at previously scheduled times to obtain status reports, have questions answered and agree on next steps. Equally important is the ability to bring groups of people together via a conference call at a moments notice.

Emergency notification capability is another baseline requirement. This capability is required not just to alert and contact emergency responders, but to provide information to a wide range of audiences that may not have the ability to

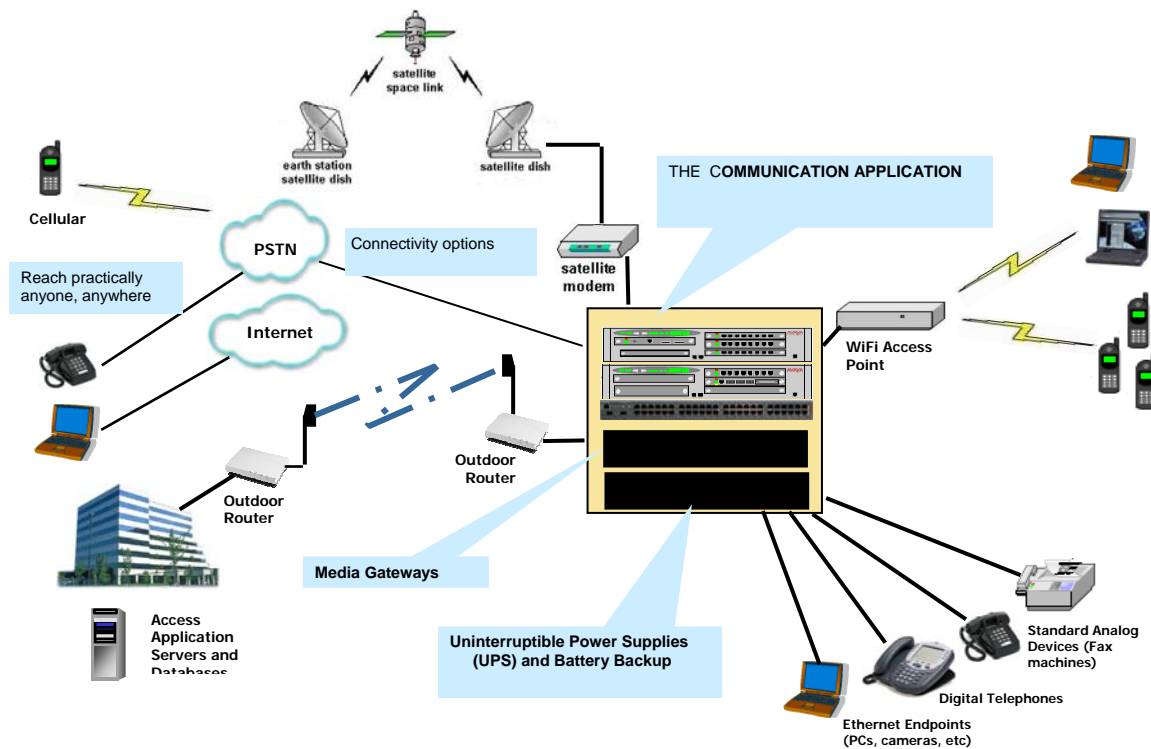
originate communication, or if they can, not get access due to overloaded communications facilities. This capability should include multiple means of communications to increase the likelihood of recipients receiving the notification. Communication solutions should also support multiple communications channels including voice, email, and paging options that try all or some of these until the message and its confirmation is received. These kinds of systems should also ideally provide a summary of who has received what message to further facilitate planning and resource deployment. This tracking mechanism must be tied into surviving fixed communications systems.

Some consideration ought to be given to installing some of the available mobile systems into fixed locations as replacements for lost capability as sites are returned to operation.

Emergency communication solutions must be highly reliable and based upon fully tested, proven technologies. They also must be designed to provide end-to-end capability. Security is also a vital requirement as temporary communications may traverse open networks while protecting access to proprietary systems and information that is passed across the network. Finally, it must address both voice and data communications needs.

Figure 1 depicts the architecture of an emergency mobile communications solution that begins to address this broad range of requirements. The heart of the solution is the communication application which provides the intelligence that connects people automatically using the best, most economical channels available. Connectivity options must include satellite, internet and public and/or private networks, WAN: wired, optical or WiFi. Media Gateways are used to provide Telephony, Internet and Endpoint Connectivity. Power is supplied with generators, Uninterruptible Power Supplies (UPS) and Battery Backup to ensure available and continuous operation. Data communications capabilities are built in to enable access to a range application services. The solution also supports a broad choice of user endpoint devices including: WiFi endpoints, Cellular and radio units, wired devices including digital telephones, Ethernet endpoints, and standard analog devices such as POTS-based telephones and fax machines.

Emergency Communications Environment



Day Two Communications Requirements for Recovering Communities

Once an actual emergency or disaster has passed and the immediate needs have been addressed, we must look to the next phase of the process, where communities struggle to recover.

Maintaining and/or re-establishing communications capability for the State and Local Government is paramount. These entities must have the ability to get information on a geographic basis in order to assess the situation, determine what is needed and prioritize resources. State leaders must have the information necessary to determine if assistance is needed from the Federal Government, what types of assistance is needed and where, and then issue formal requests. The Local Government must also be able to communicate with the Police, Fire, Transit Operations, and Sanitation Departments in order to mobilize them and coordinate their efforts.

The healthcare infrastructure must also be rolled into action. Communications between hospitals and other medical facilities must be restored or established to ensure that all resources are being utilized effectively and efficiently.

Conferencing capabilities are critical in this instance. The availability of beds must be known on a continuous basis so that patients can be directed to facilities that can accommodate them. Specialists in one hospital must be able to communicate with doctors in other facilities to assist them in treating their patients. Patient data must be able to be shared between doctors at mobile facilities.

Charitable organizations specializing in emergency relief such as The Red Cross and Salvation Army and FEMA funded groups must quickly focus on both assessing critical needs and orchestrating their logistical response – raising funds, obtaining needed goods and services and delivering those goods and services to the locations and people that require them. Field representatives must determine what is needed and where, and be able to communicate that back to a central location. The central location then needs to synthesize the information from various field locations, secure required goods and services, and coordinate their distribution. Hurricane Katrina demonstrated that without an effective communications network, relief efforts can break down. In many cases, goods were available, but not in the locations where the people who needed them were located.

In any disaster, insurance companies quickly become a key player in providing financial support for victims as they assess property and casualty damage, enable policy holders to quickly and easily file claims, and provide clients with funds to live on an interim basis. This requires that insurance companies set up temporary field offices to service their customers and coordinate the efforts of their representatives, adjusters and other employees. Basic requirements include mobile communications services, voice, video, and data capabilities.

Banks and other financial institutions are critical to the recovery process. Voice and data communications must be established so that people can have access to their funds through surviving ATMs and traditional banking locations as well as new temporary locations that require communications capability. These communications must be secure in order to verify identification, ensure availability of funds and make records of every transaction.

Another key lesson from Hurricane Katrina is that the interim emergency communication solution must remain in place for a much longer timeframe than previously thought. In fact, the interim solutions often became a quasi-permanent solution. Given the extent of recent disasters, both emergency and core service providers should be considering significant expansion in the number of available emergency communications systems.

Restoration of Business Operations

The next phase of the recovery from an emergency or disaster is the process for restoring commercial business operations. First and foremost is the requirement to keep in touch with employees, customers and suppliers. Notification capabilities are critical in this effort as instructions on how to make contact can be disseminated to voice mail boxes, e-mail addresses, cell phones etc. Conference bridges can be established, allowing employees to call-in to obtain instructions on how to proceed and coordinate damage assessments and deployment of resources. This becomes critical for delivering a consistent message to all employees regarding process and policy changes for how to interface with customers.

In situations that follow a disaster or emergency, the assumption must be made that all employees can become teleworkers. They may not have the ability to get to their work location and may have to work from home or another temporary location. IP telephony capability can be very beneficial in this situation as IP phones can be connected via the Internet into the core communication system using secure encryption technology such as VPN. However, since some employees may not have broadband connections into their home, consideration should be given to a communication system that allows these employees to control their communications while communicating through their home or cellular telephone. Again, conference capabilities are essential in terms of gathering and exchanging information, discussing options, making decisions and implementing action plans.

Multi-modal communication capability is also a baseline requirement. Employees will not be in a position to communicate in the same manner. Some will have PDAs, some will have cell phones, some will have e-mail access, some may have WiFi capability, etc. The ability to develop and execute a plan that incorporates these diverse technologies will speed the restoration process.

Businesses will also need to be able to field inquiries and requests from their clients or customers. Establishing a virtual call center, where calls are routed to employees working remotely would help to address the situation.

Lightening the Cost Impact of Emergency Communications Systems

The cost of acquiring emergency communications systems and capabilities can seem unreasonably high – especially if multiple systems are deemed necessary. In order to mitigate the cost impact, organizations should strongly consider a dual-use strategy – utilizing the system in a broader range of applications and

situations. Using these systems on a more regular basis would not only make them more cost-effective, but would allow the people responsible for deploying them and getting them up and working in a timely fashion to gain valuable experience with them. In this way, when an emergency does occur, they would be well-versed in the system and its operation, so it could be deployed quickly with minimal difficulties – something that is so critical in an emergency or disaster situation.

There are a number of alternative uses for an emergency communications system. In a case where construction is being done and employees have to be relocated to temporary office space, the system could be used to provide the needed communications capability. In a situation where an organization needs to quickly open a new location to serve their clients or take advantage of a market opportunity, they can deploy the emergency communications system and be up and running in very short order. Other potential applications include tradeshows, hotels and convention facilities.

As we have detailed throughout the paper, conferencing capabilities are critical to emergency communications. This capability can be utilized on a normal, everyday basis to reduce conference service expenses. The same holds true for an Emergency Notification Application. The application can be used in non-emergency situations such as notifying employees, customers and suppliers of snow closings, power outages, and IT system problems.

Conclusions

Communication is critical when an emergency or disaster occurs for government and private enterprises. Every business or operation should have a continuity and disaster recovery plan that addresses communications backup considerations. An emergency backup communications system should be available for deployment on a moment's notice. Multi-modal communications flexibility including stand-by satellite service, WiFi, cellular and radio should be included to ensure not only connectivity, but conversion and integration as well. Conferencing capabilities, broadcast notification applications, teleworker, and mobility applications are all critical components of the solution. Emergency communications solutions must be designed for end-to-end capability and to cover a wide range of situations.

To reduce the costs associated with emergency communications systems acquisition, many of these systems and applications can be utilized on a normal, everyday basis for extended operations or events. And finally, a detailed, comprehensive emergency communications plan also should be developed and tested. Duplicating spare equipment is not enough if the processes to effectively deploy and use them are not in place.

While every disaster has its own unique characteristics and surprises, the lessons learned from the recent past can be of enormous help in preparing for future emergencies. We as a nation do not want to pay twice in pain and suffering for information that is readily available for those who plan ahead.

About GreenSpringPartners and the authors:

GreenSpring Partners is an industry analyst and consulting firm focused on driving profitable growth for its clients. The principals at GreenSpring Partners, Richard Kent and Harold Tepper, are engaged in an ongoing effort to help shape the landscape of infrastructure possibilities – hardware, software, applications and services -- for both enterprises and service providers as they migrate to next generation networks. For more information about GreenSpring Partners go to www.greenspringpartners.com.

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