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Planning and Developing Effective Emergency Mass Notification Strategies for Hazardous Industrial Applications in the Post 9/11 Era.

Federal Signal Corporation
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Abstract

Emergency mass notification for hazardous industrial processing operations has traditionally focused on audible and visual signaling devices such as sirens, horns, warning lights, beacons, public address and intercom systems. And the extent of the ability to quickly alert anyone outside the plant—including fire, police and medical first responders—was until relatively recently limited to auto-dialing telecommunications. On September 11, 2001, however, everything changed.

The horrific terrorist attacks on the World Trade Center in New York City dramatically accelerated the evolution of mass notification strategies and technologies. This has been particularly evident in the case of hazardous industrial applications, and resulted in plant safety being suddenly and inextricably interwoven with critical security and detection functions. The threat of terrorist attacks has most definitely prompted industrial plant managers to completely re-evaluate their approach to emergency mass notification—both internally and externally. And for obvious reasons, this comprehensive re-examination of mass notification requirements has had a substantial impact on facilities that process, use, store and distribute hazardous chemical materials.

Compliance with directives from government agencies is clearly one of the driving forces propelling this comprehensive re-assessment of emergency mass notification planning, systems and resources. Also at play is the subsequent proliferation of new software-driven technology riding on existing network topologies; and the deployment of seamless, multi-device, interoperable communications both within and outside the facility. Finally, there is the growing trend towards integrated systems, which in this instance encompasses the integration of disparate mass-notification devices and communication systems to achieve the highest possible levels of reliability and monitoring through redundancy and operational simplicity.

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Introduction

The vulnerabilities of industrial facilities that process, use, store and distribute hazardous materials to the threat of terrorism were brought to the surface in the wake of September 11th, 2001. This tragic event served to attract the renewed attention of government agencies, community leaders and the general citizenry to matters of public safety directly related to large-scale processing of hazardous materials. And with good reason.

To illustrate, in April 2007 the U.S. Department of Homeland Security (DHS) reported that approximately 7,000 chemical processing facilities—roughly half of the nation's chemical plants—are at high risk of a catastrophic accident or terrorist attack. Of these facilities, 101 of the most dangerous plants place more than 80 million Americans within range of a worst case toxic gas leak, explosion or terrorist attack, according to an American Progress' November 2008 report entitled "Chemical Security 101." And keep in mind, this report focuses exclusively on chemical plants and does not include other types of facilities such as petroleum refineries and gas storage and distribution operations.

Considering the potential risks to human life and property, the renewed emphasis on emergency mass notification planning for facilities that process hazardous materials comes as little surprise, particularly in the wake of a disaster the magnitude of 9/11. Clearly, the stakes for developing and maintaining effective emergency notification and response plans are indeed high, beginning with the need to safeguard life and property. Other considerations include:

- Potential penalties and fines resulting from failing to comply with government regulations.
- Maintaining a safe working environment that contributes to positive employee moral.
- Avoiding potential civil and even possible criminal liability.
- Suppor ting a favorable public image of good corporate and environmental citizenship.

An emergency as defined by Webster's Dictionary, is "An unforeseen combination of circumstances, or the resulting state, that calls for immediate action." This definition encompasses any number of occurr ences that can, and should, be considered "emergencies". Consequently, an emergency plan should take all of these into account as they all have similar characteristics:

- Surprise
- The need for immediate response
- A situation that calls for unusual "reactive" measures
- The possible involvement of outside groups or agencies
- The need for calling a number of people away from their normal functions

All of these characteristics require that the actions taken as a result of an emergency require thorough preparation; are thought through to the greatest extent possible; and then tested and rehearsed to ensure maximum effectiveness.

Emergency Mass Notification Planning

Each industrial manufacturing or processing facility is different. Though hardly a revelation, the idea that each individual plant facility presents unique requirements in the area of emergency preparedness and mass notification is a point consistently acknowledged by federal, state and local government agencies.

With regard to security initiatives, for example, these unique requirements are reflected in new federal directives that range from the number of required perimeter fences to the outside illumination standards for a particular chemical storage facility. Additionally, states such as New Jersey have enacted regulations that are even stricter than the federal guidelines. In any event, both federal and state requirements are tailored to the specific hazards posed by individual chemical facilities.

Staying with the example of chemical processing operations, the requirements for an emergency mass notification strategy can also vary significantly from one chemical plant to the next. Beginning with such basic considerations as the type and quantity of the chemicals being processed, a successful mass notification strategy will focus on issues as diverse as ensuring failsafe reliability through redundancy and effective monitoring across disparate systems; initiating and maintaining seamless communications with local first responders and government agencies; and establishing effective communication protocols for alerting employees, management and citizens of the surrounding community.

Decisions will never need to be made more quickly than in the event of a catastrophic incident; and access to information is the most critical factor to eliminating hesitation and doubt. Though technology continues to promote faster and faster modes for response (including software automation to initiate alerts and subsequent action plans based on pre-determined scenarios), it stops well short of supplanting the need for comprehensive emergency planning, including the development of effective mass notification procedures, resources and personnel training. It may sound like nothing more than common sense, but there simply is no substitute for thinking ahead when it comes to being prepared for an emergency.

Thoroughly defined objectives that reflect the requirements of a particular plant facility will invariably result in a unique set of priorities. In one case these priorities may stress "when" and "who" needs to be notified. In another instance the focus may be on determining the most effective method to ensure that everyone—employees, management, visitors, contractors, etc.—in the facility is alerted during different types and levels of emergencies. And still another facility may emphasize the need for real-time bi-lingual

emergency alerts, or multiple network support, or ad hoc and system-automated alert notifications. These are just a few examples of the type of planning criteria that go into building an effective platform for a successful mass notifications strategy.

Though a potential terrorist attack is currently on top of peoples' minds, it is worth noting that a chemical processing plant, for instance, is in fact far more likely to experience some other type of emergency incident. The likelihood of a fire, explosion, hazardous spill, toxic leak, as well as the potential for extreme environmental and weather conditions (tornadoes, floods, etc.) remain critical considerations in establishing objectives for a comprehensive approach to mass notification.

Beyond supporting emergency response, today's mass notification systems have proven to be a valuable asset for everyday, non-emergency, intra- and inter-plant communications. This has become particularly evident in the deployment of interoperable, multi-device communications technology that not only enhances overall plant communications, but provides a host of useful software-based management and administrative tools. Additionally, many of the more traditional approaches to mass notification, i.e., public address and intercom systems, e-mail, and voice and text messaging, provide everyday functionality for plant communications and process control that represents attractive potential for return on investment.

Unfortunately, though a critical aspect of emergency preparedness, mass notification has in the past been too often overlooked. As a result, facilities that have failed to be vigilant with regards to emergency planning and preparedness may find that their original procedures and systems are by today's standards anything but "best practice" if not at least somewhat outdated.

Despite government oversight, the shortcomings at many facilities have ranged from insufficient audible coverage for indoor warning alerts, to confusing menus of tonal alerts, to inadequate communications and contingency planning in the event key personnel are unavailable to initiate emergency plans. Employee and management training that is either insufficient or infrequent is another issue that surfaces with disturbing regularity.

Complying with government regulations often calls for contending with the overlapping authority of multiple federal agencies, as well as the involvement of state and local agencies. For instance, the regulation of chemical plant safety has long been shared by a number of federal regulatory bodies, most notably the Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA). More recently, DHS has issued its own regulatory mandates designed to oversee the security aspects of high risk chemical facilities.

Additionally, most states also have agencies monitoring workplace safety and health, as well as environmental issues. Aside from the potential for confusion between these various regulatory bodies, each of these organizations should be viewed as a valuable source for guidelines when it comes to site-level emergency and security planning, as well as mass notification communications.

Among the most significant federal emergency planning statutes that specifically address mass notification for chemical processing facilities are OSHA Standard 1910.165—Employee Alarm Systems, and OSHA Standard 1910.38—Emergency Action Plans.

The EPA's Superfund Amendment and Reauthorization Act (SARA), Title III—Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986, features four major sections that apply to chemical facilities and touch on emergency mass notification: 301-303—Emergency Planning, 304—Emergency Notification, 311, 312—Community Right-To-Know, and 313—Toxic Chemical Release Reporting-Emissions Inventory.

Plant security and detection for high risk chemical facilities are covered under DHS's Chemical Facility Anti-Terrorism Standards (CFATS). These regulations are also intended to address the need to safeguard chemicals that could be used by terrorists to attack a different location. To determine which chemical facilities meet CFATS criteria for high risk chemical facilities, DHS has developed the Chemical Security Assessment Tool (CSAT) Top Screen, an easy-to-use on-line questionnaire that must be completed by facilities that possess any chemical listed on CFATS Appendix A: DHS Chemicals of Interest List.

What is the best way to respond to an emergency? The answer can be summed up in two words: Be Prepared!

Preparing for a catastrophic emergency can be broken down to the following basic stages:

- Assessing potential risks
- Anticipating emergency scenarios
- Previewing possible contingencies
- Developing and documenting emergency procedures
- Deploying sufficient system resources based on "best practices"
- Implementing management and employee training

Plans should subsequently be rehearsed and tested, with results evaluated to ensure reaction is both timely and effective. Often overlooked, emergency planning and mass notification strategies also need to be regularly reviewed and updated to ensure they are in synchrony with each other; make effective use of currently available technology; and reflect industry best practices.

Though it may sound simple, the point cannot be emphasized enough: Being prepared for an emergency with an effective mass notification strategy will depend heavily on the establishment of clearly defined objectives beginning from the earliest stages of system development.

Notification and Alarm Systems

In developing a mass notification site strategy it is critical to evaluate systems for their ability to notify employees of emergency situations at all locations in the facility. In some areas of a facility, such as high-noise locations, audible alarms may not be sufficient. Devices such as horns, sirens, public address systems, intercoms, flashing lights, etc., can be used for site notification depending upon the size of the

site and the variety of potential emergencies. Notification systems may vary from single-signal units to multifunctional/code series systems. If a code system is employed, all employees need to be aware of the various codes and what they represent.

Another component of mass notification/alarm system planning centers on the capability to notify community officials, emergency response agencies (fire, police and emergency medical personnel), neighboring facilities and the community at large. These types of alarms will vary depending on the geography of the community, and the pre-established intent of the alarm system. Telecommunications or special radios can be used to notify these groups, while nearby facilities can be alerted by audible alarms. In almost all cases—both internal and external—consideration should be given to the need for auxiliary power supplies.

Communications

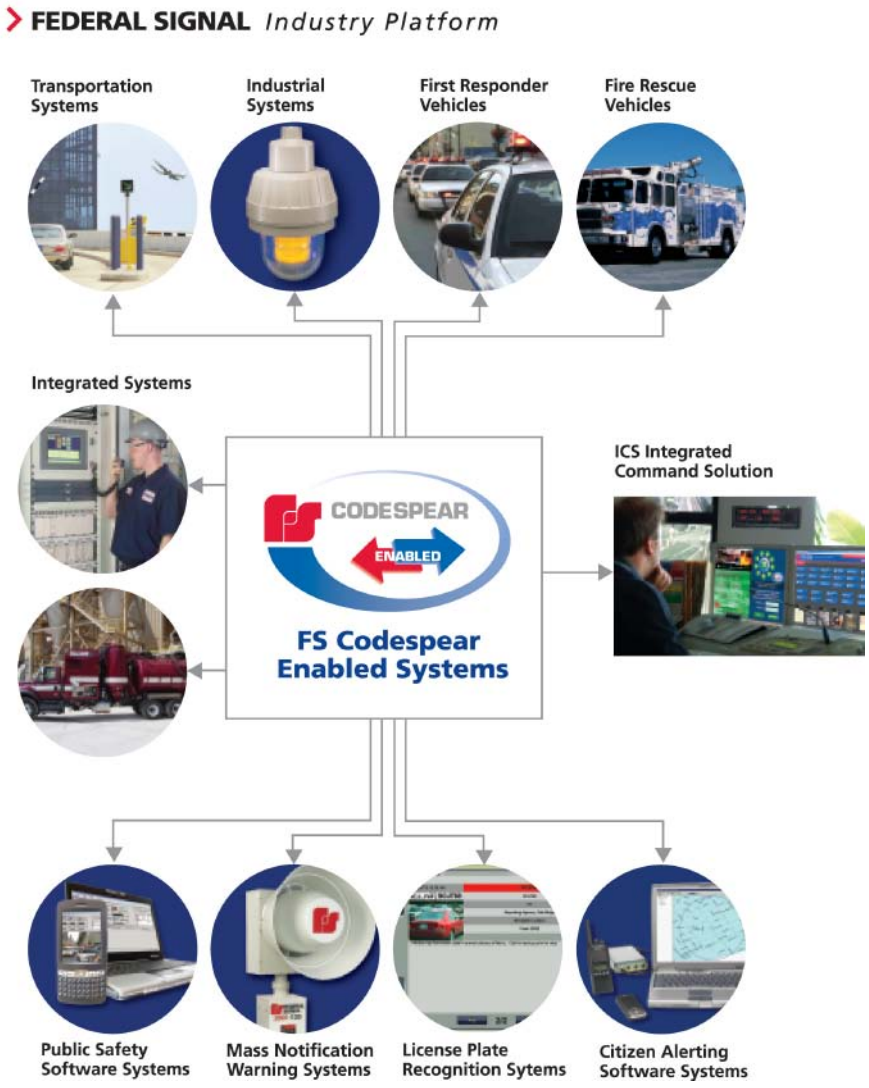
During an emergency, effective and reliable communications are vital. A number of methods can be used, including telephones, public address systems and two-way radios. Portable and mobile two-way radio equipment can be particularly effective during an emergency since the normal means of communications such as telephones and internet may be overtaxed or completely incapacitated.

Another consideration is reserving communication capabilities for "official" use during an emergency situation by blocking out unauthorized communications. Site telephone circuits could quickly be overwhelmed with calls, making telephone communication difficult if not impossible. Consequently, it may be advisable to consider the deployment of direct "hotlines" by reserving certain outgoing communication lines specifically for emergency use only.

System Integration

Personnel warning, communications and security requirements have traditionally been thought of as individual systems dedicated to specific needs. These systems have grown in complexity, and expanded in number to encompass everything from general alarm (horns, sirens, signaling beacons, etc.), public address, intercom, telephones, paging, voice and text messaging, and email, to real-time, IP-based communications.

Integrating the disparate components of a plant's mass notification system (i.e., sirens, signaling beacons, fire/gas systems and public address, etc.) is now critical to ensuring effective redundancy and monitoring for plant emergency communications and warning. The inherent automation that accompanies integration of audible, visual and digital systems not only speeds incident response times significantly, but also provides decision makers with access to the invaluable, up-to-the-minute data necessary to respond effectively as emergency events unfold.



Redundancy remains a key priority of any integrated mass notification system design. The objective is to provide the immediate and automatic system back-up necessary to achieve the highest possible levels of failsafe operation and monitoring. Decentralizing control of the system not only produces higher levels of redundancy but also enhances system intelligibility and ease of use.

Integrating disparate mass notification system effectively automates hazardous monitoring and warning functions, thereby assuring both failsafe operation and accelerated response times. While IP-based interoperable technology is having a powerful impact on emergency mass notification, and continues to show substantial promise for the future, it does have its limitations. These shortcomings become evident in any discussion of the need for redundant system backup and monitoring, particularly as it relates to integration with more traditional emergency warning/alert systems and devices.

As illustrated by recent public emergencies including campus shootings and natural disasters, there remains a possibility that the infrastructure for local telecommunications and internet access could become overtaxed in the event of a catastrophic incident. Though interoperable communications has emerged as an important element of emergency mass notification strategies, reliance on telecommunications and internet infrastructures has on occasion proven inadequate. This in turn has spotlighted the need for automated backup by more traditional warning systems such as sirens and signaling beacons.

In the case of a plant processing facility emergency, such a deficiency could seriously impair the ability to initiate both conventional and automated telephone, text messaging, paging and e-mail notification of employees, as well as local officials and the general public. A fully integrated system that offers the reliable back-up of additional alert systems (i.e., sirens, horns, loudspeakers and signal beacons and warning lights), ensures that redundancy is built in at all levels of the emergency mass notification system.

Plant safety and security requirements will continue to change dramatically in the years ahead. Consequently, mass notification systems must be adaptable to changes in the future. At the same time, technology is continually creating new opportunities for efficiencies while establishing higher and higher standards for best practices. Engineering mass notification systems to accommodate these changes is not only critical but simply makes good business sense.

A word of advice in developing an emergency mass notification strategy: Keep it simple. Complex warning alerts and messages, or an excess number of scenarios and action plans could well add to the confusion of an emergency situation. For this reason, simplicity should be engineered into all levels of a mass notification plan.

When a facility begins laying out their strategic emergency plan, limiting the number and simplifying the complexity of warnings/alerts is a critical consideration. For example, at the world's largest liquefied natural gas production facility, a single alert tone is used for all emergency situations. Though the system employed at the facility is capable of providing hundreds of different alert tones, employing just one eliminates the need for employees to memorize, interpret and react to multiple tones and their associated meanings. In this instance, once the tone sounds it is immediately followed up with more detailed voice instructions broadcasted over the public address system. By that time, however, the entire facility has already been alerted to the need to take immediate action.

Now compare the single-tone method of emergency warning with a slightly more complex system in use at an isomerization (ISOM) plant at a major Texas refinery, which uses four warbler siren blasts: one for testing, two for work stoppage, three for evacuation of non-essential personnel, and a continuous blast for total evacuation. Though slightly more complicated than the single tone example, this approach to mass notification is still effectively simple.

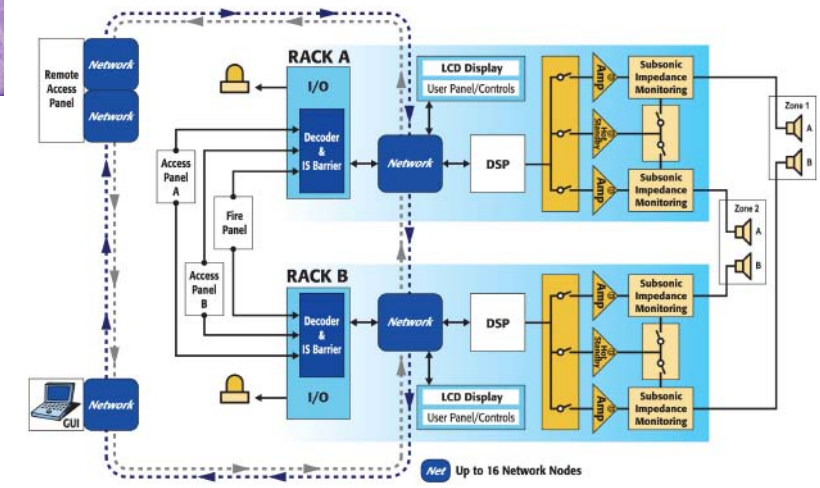
One point remains clear: A mass notification system cannot afford to leave anyone in the facility uninformed of an emergency situation. Consequently, in addition to alerting all employees, the system must effectively warn anyone else who happens to be in the plant, such as vendors, outside contractors and visitors. Through a variety of system and communication integration methodologies, engineering simplicity into a mass notification strategy becomes an effective means to ensure that no one is left out of the loop during a life-threatening emergency.

Best Practices

The question begs to be asked: If a plant's emergency mass notification system is not based on best practices, then exactly what is it based on? Unfortunately—and with an understanding that human life may be at stake—when it comes to emergency mass notification strategies best practices are the only practices that make sense.

The trend towards network management over discrete wires and relays stands out as a marked improvement over mass notification systems of the past. Enabling users to distribute data and information over a network is both faster and more efficient. As an added benefit, there is also the cost savings that accompany a substantial reduction in infrastructure requirements.

Network-managed systems also accommodate a broader range of media, such as audio and video, providing an increased level of communications effectiveness and flexibility. A proven methodology, now standard throughout the MIS community, Standard Network Management Protocol (SNMP) supports continuous remote monitoring of individual mass notification system components, thereby assuring the beneficial tandem of improved reliability with reduced maintenance requirements.



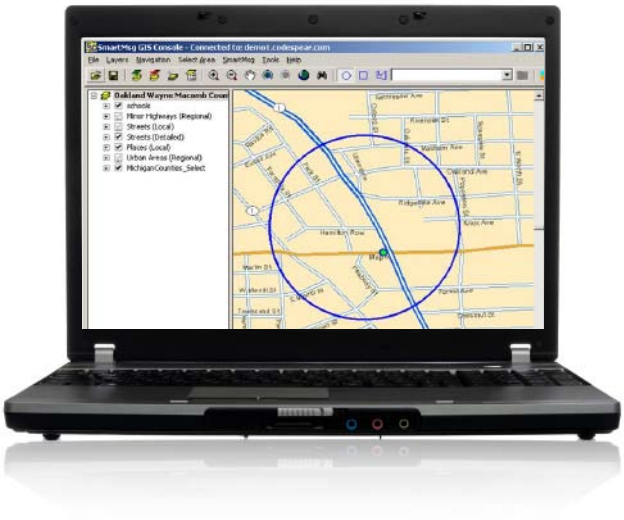
The use of standardized (non-critical) MS-Windows™-based system monitoring and configuration software presents another technological step forward in the field of mass notification. Systems are not only easier to install, but they permit simple, routine modifications to be made in the field, and without the need for custom factory software. With just a "point-and-click" users are now able to program settings into a non-volatile memory. There are, of course, a number of built-in protections to prevent unauthorized users from making modifications.

The increased use of fiber optics represents another important trend that offers enormous benefits, especially for larger, multi-facility production operations. By using fiber-optic transmission to link

facilities in redundant, completely "self-healing" communication rings, users are experiencing heightened standards of reliability, as well as enhanced flexibility with simplified and less costly maintenance.

Many improvements have been made in the area of mass notification system planning and installation. One of the most promising of these is the use of satellite images for laying out plant facilities. These images are now being incorporated as overlays with site drawings to calculate theoretical sound coverage for audible alerts such as sirens and horns. The imaging technology is also being employed in GIS (Geographical Information System)-based mapping for targeted alerting on both a local and regional basis.

No discussion of best practices in mass notification would be complete without a mention of the role for effective and continuous training. Organizations need to take a strong stance on this issue to ensure that operators and employees not only react quickly and instinctively to all emergency scenarios, but are also thoroughly familiar with "when" and "how" to effectively use the system. For this reason, plant operations are increasingly drawing on the expertise and experience of mass notification equipment/systems vendors and integrators when making decisions with regard to emergency training of employees and managers at all levels. These resources can be invaluable in making assessments with regards to the most user-friendly technologies, and implementation of the most effective cross-departmental training procedures.



Interoperable Communications

Mass notification for today's plant facilities covers both indoor and outdoor requirements, and calls for interface with the telephone/PABX and plant intercommunications systems, public address, tones, voice messaging, etc. Through traditional loudspeakers and a variety of illumination signaling devices, these "back-end" systems actually produce the warnings and notifications. On the "front-end" of emergency notification—performing the function of activating and integrating these back-end systems—are the intelligent, IP-based interoperable technologies that have evolved in the wake of 9/11.

Not to be confused with integrated communications, interoperable communications supports a facility's capability for "real-time" communications and urgent notification of multiple parties using multiple devices. IP-based software-centric interoperable communications represent the gateway to intelligent mass notification for the future.

The next step in providing a "total solution," interoperable communications is the key to establishing seamless, multi-media communications with fire, police and medical first responders, local authorities and citizens of the surrounding communities. Additionally, interoperability supports and augments a number of other incident response and emergency preparedness initiatives, including wide-area alerting and data sharing between multiple agencies.

Utilizing an embedded Voice Over IP (VoIP) architecture, and equipped with a Radio Interoperability Module, Federal Signal's Codespear SmartMsg™ application permits simultaneous text and voice broadcast of alert notifications to two-way radios, "push-to-talk" enabled devices (i.e., Nextel and other supported cell phones), PCs, telephones (PBX, IP-based, cell and satellite), pagers and wireless PDAs. The Interoperability Module also facilitates fully integrated, real-time communications between two-way radio and "push-to-talk" groups, phoens and PCs. This software-based solution supports radios from different manufacturers, across multiple bands/frequencies and pre-defined talk groups.

Interoperable communication platforms such as the Federal Signal's Codespear, offer a host of previously unavailable benefits. This includes integrating voice and data communications; facilitating seamless communication bewtween a wide range of devices—from PCs, radios and phones (cell, IP and PBX); and permitting multi-band radio interoperablity that supports both one-way alerts and two-way communications.

Codespear's authenticated and encrypted application ensures the security of confidential data with hosted and non-hosted options, while supporting communications over public internet, PSTN, WAN, 802.11b, VPN, cellular, satellite and radio networks. Other benefits available through the Codespear interoperable communications system include:

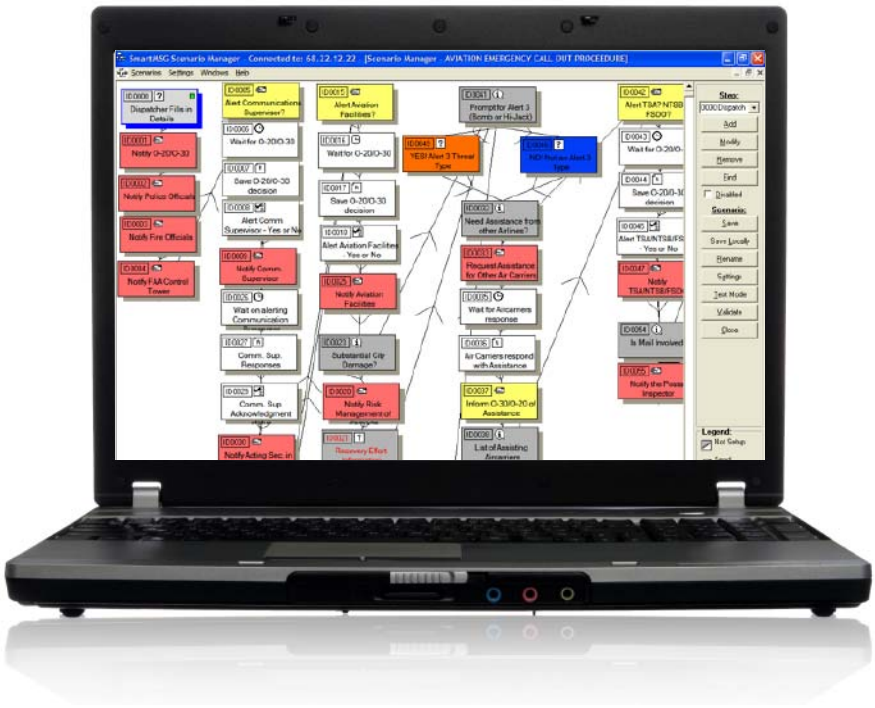
- Voice-Over-IP communication, radio linked talk groups, and 2-way text or voice communication.
- Multi-lingual messaging
- Real-time translation in 12 languages for alert notifications and multi-lingual secure messaging, with auto-translation between users of different native languages.
- Text-to-speech conversion

- Alerts & two-way communication across multiple voice and text based messaging channels (e.g. typed message on PC can speak message to PCs, phones, radios, PA system).
- Secure messaging between multiple agencies/entities
- Separate agencies and entities can instantly share alerts and initiate secure communications.
- Video capability
- Secure video conferencing and mobile video or picture viewing via handheld devices.

Integrated incident planning and execution tools serve as a "nerve center" to trigger and coordinate response, communication, alert notification and the collaborative efforts of employees and management, local officials and agencies, and first responders.
An extension of alert notification and secure-messaging software, integrated incident planning and execution tools support NIMS/UICS (National Incident Management System/Unified Incident Command System), and provide a method for defining "tiered response" plans to events initiated both internally and externally. Known as scenario-management software, these applications integrate alerting, communications interoperability and collaboration tools to automatically activate multiple forms of communication.

Deployed at a plant facility, systems such as Federal Signal's Scenario Manager enable incident events and related tasks, and emergency procedures and command and control confirmations to be configured in step by step "chains" via graphical process maps. In the event of an explosion or toxic leak, for example, multiple emergency steps can be initiated with the touch of a single button, and everyone who needs to be notified will be notified, regardless of where they happen to be.

Scenario management systems allow users to pre-define automatic procedures for various events based on specific needs. Scenarios may be programmed to cover any series of actions, including broadcasting alerts, evaluating responses, pulling data from external systems, activating standby channels and more. Scenario management applications can be used to automate emergency incident procedures and contingency plans in much the same way flow charts are used to document software or a manufacturing process.



Conclusion and Review

The tragedy of 9/11 represents a benchmark event in emergency preparedness for hazardous material industrial applications while marking the beginning of a new era in mass notification. In addition to predictable further tightening of government regulations, demand for network-based systems, new interoperable communications technology and system integration will no doubt continue at an invigorating pace.

Beyond the possible loss of human life there are the potential costs to the environment. Add to that damage to facility resources, the threat of litigation and fines, and the harm such a catastrophe can pose to an organization's reputation, and the consequences of failing to develop an adequate mass notification strategy is simply too grim to even consider.

10 Practical Steps to Emergency Planning and Notification
Advice for developing a strategy, addressing unmistakable and underappreciated issues and avoiding common mistakes:

1. Establish clearly defined objectives. Emergency preparedness begins with assessing risks and preparing for possible emergencies by evaluating all scenarios, threats and affected stakeholders. For example, a plant located close to a school, hospital, or other potentially impacted public areas should ensure proper communication and planning before an event occurs.

2. Remember: Individual facilities present unique requirements. Priorities may stress "when" and "who" needs to be notified in one facility, while a second facility needs to emphasize real-time bi-lingual emergency warnings or system-automated alert notifications. Assess employees' English comprehension by contacting HR or conducting an internal survey to identify potential language barriers and ensure they are fully addressed during training and tests.

3. Test and evaluate plans and systems annually. Plants should designate at least one day each year for all employees to take part in refresh training and a test exercise. If changes occur with plant personnel, plant structures or new dangerous chemicals, the plant should conduct an assessment to ensure all technologies and scenarios are still relevant and efficient.

4. Integrate systems to achieve adaptable monitoring and failsafe performance. Technology continually creates new opportunities for efficiencies while raising standards for best practices. Assess all current communication technologies in use to identify and address gaps in system-wide integration for monitoring and redundant, automated responses. Mass notification systems must be forward-looking and engineered to support new technologies.

5. Keep it simple. While hardly a revelation, this rule can get lost despite best intentions. Too many instructions can confuse employees at all levels. For example, lengthy, complex fold-out directions that require employees to stow away inside their hard hats may prove counter-productive to effective, real-time response.

6. Leverage technology advancements for performance and cost advantages. Think about the future: The data carrying abilities of fiber optics alone enables the expansion of technologies to come. If not already in place, fiber optics can be added to provide heightened standards of reliability and flexibility, as well as simplified, less costly maintenance.

7. Stay focused on user-friendly technologies. The human element of mass notification is critical to ensuring quick and instinctive emergency response. However, its value is substantially diminished when operators and employees are not properly trained in "how" and "when" to use the system to activate the appropriate warnings and notifications for prescribed scenarios. Make sure operators/administrators are trained across departments to ensure necessary coverage 24/7.

8. Make interoperable communications part of a "total solution." IP-based software-centric interoperable communications represent the gateway to intelligent mass notification by supporting real-time communications and urgent notification of multiple parties using multiple devices, networks and frequencies. This enables seamless, multi-media communications with first responders, local authorities and citizens, as well as augmented incident response and emergency preparedness.

9. Map incident planning and execution chain of events. Use scenario-management systems to enable incident events, related tasks, emergency procedures and command and control confirmations to be configured in step-by-step "chains" via graphical process maps. In the event of an explosion or toxic leak, multiple emergency steps can then be
initiated with the touch of a single button to enable everyone to be notified regardless of location.

10. Achieve additional return on investment. Mass notification systems can be valuable assets for "everyday," non-emergency, intra- and inter-plant communications (e.g. public address and intercom systems), enabling key personnel to become more familiar and comfortable with system capabilities. Encourage designated plant personnel to use tools to become more connected and integrated with plant floor operations or other priority business areas.