

In Developing Mass Notification system

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Abstract— This paper will give clear idea about what are the points to consider in developing Mass Notification System. Clear communication is always important – whether it's a routine message about avoiding a full parking lot or a stressful emergency situation where people have to be guided out of harm's way. Mass Notification is an efficient, effective and very flexible application that uses today's most common communication technologies to provide notification functionalities to the building management platform assuring that your message gets through to the right people. Whether for a single building or a very large campus like university, the centralized portal provides you with the right tools to respond/response to any situation and communicate the appropriate message quickly and clearly. It easily integrates existing security system, and communication infrastructure as well as today's most common Web-based and mobile App modalities.

Index Terms— Mass Notification system, MNS, Building Technology, Public safety, Emergency Notification, NFPA, Fire and safety

1 INTRODUCTION



Figure 1.1- "Khobar Towers After Terrorist Bombing"

Mass notifications system or Emergency system was first distinct in 1997 by the United States Department of Defense (DoD) in an undercover document or report termed the: "Khobar Towers Report". The report was represented in reply to the fatal terrorist bombing attack of an American Military housing complex in Saudi Arabia in 1996. In synopsis, the report accomplished that significant loss of life could have been reduced or even avoided completely, if there had been an effective means of alarm and "Emergency notification" in place at the housing/building facility.

In order to move forward with a solution, DoD represented the Unified Facilities Criteria 4-021-01 (UFC): Design and operation of Mass Notification Systems requirements document. This document established the course of action for providing life safety systems in US Military (defense) facilities. The core focus of the UFC document was to identify the ability to issue intelligent notifications such as "shelter-in-place" directives to save lives.

A mass notification system is intended to communicate in-

formation about emergencies, including fire, terrorist activities, chemical spills, biological events or natural disasters. The first step of a functioning Mass Notification System or Emergency System is to warn and give notice to the building resident and key human resources what the situation is and where it is taking place. Second, it provides instructions about what actions to take. Third, it verifies and get acknowledgment from recipients that a sent message was heard or received by its recipients.

Ensure every emergency communication finds its intended recipient.

Truly effective and efficient way of communication is about more than getting the message out and received by recipients; it's about ensuring that the message gets through. Irrespective of recipients or humans locations, mass notification solutions need to help. Messages or notifications come across networked devices like personal computers, LED signs, Audio zone, Pager, IP speakers, Mobile phones. Audio messages broadcast over Audio zone/IP Speakers can be heard clearly from miles away; cell phones or pagers and other personal devices quickly receive targeted messages.

Any message, every location

With mass notification solutions, you have a plan for contacting people as efficiently and accurately as possible, wherever they are.

Inside The Affected Premises

Mass Notification System need to send messages to people anywhere in your building/premises by interfacing with LDC Display, Audio Zones, LED signs and scrolling digital signs. Messages can also be sent to every personal desktop using desktop notifications and mobile phones on your network and through existing fire alarm and IP speaker or Audio Zone systems..

Outside The Affected Premises

Meet the challenge of huge distances and deafening outdoor environments. With powerful Audio zone systems, digital

signage and strobes you can get recipients attention and deliver your message with maximum clarity.

At Your Side

Efficient and precise, MNS need to send messages directly to any mobile phones, IP phone (in terms of Hotline) and email address or even desktop notifications, no matter the location.

2 IN DEVELOPING MASS NOTIFICATION SYSTEM

At present, many buildings and building campuses in installing mass notification or emergency communication systems to improve communication from the building or emergency officials to the public. The National Fire Alarm and Signaling Code National Fire Protection Association (NFPA) 72, 2010 edition, provides requirements for the application, performance and installation of emergency communication (or mass notification) technology (NFPA 2010a). However, NFPA 72 chapter 24 gives modest directions on "how to use and develop Mass Notification Systems" for effective and efficient way. NFPA Maintain standard and code of conduct for emergency communication systems. Additionally, many countries use British Standard BS 5839 -- Fire Detection and Fire Alarm Systems for Buildings -- Part 8 (BS 5839-8:2008), in which chapters 20 and 21 discuss emergency communications and broadcasting techniques. Some mention is made of the mechanism of message deliverance, counting the manner in which messages should be delivered to recipients (e.g., clear, concise, simple and short in a calm and authoritative manner), simplicity, message duration, and the importance of an alert tone. However, little guidance is given on the specifics of the message, including message content and length (e.g. Short message maximum length should be 160 words), speaking rate, frequency of delivery, and other significant aspects of Mass Notification System.

We should note that NFPA 72 Chapter 24 Sentence 2.2 states: "This chapter establishes minimum required levels of performance, reliability and quality of installation for emergency communications systems but does not establish the only methods by which these requirements are to be achieved."

Based on the minimum requirements of NFPA 72 Chapter 24, MNS/ECS (Mass Notification System/ Emergency Communication System) must do much additional than just activate a sequential alarm tone in the emergency situation like fire in building or flood or earthquake. MNS need to trigger other type of events (sending location of fire in building or sending shortest escape path) and convey what actions should be taken. This is where the "integrated multimodal" broadcasting features becomes common.

Human communication is naturally multimodal, involving the interaction of modalities such as speech, facial expressions, hand gestures and body posture. With respect to the Mass Notification System, integrated multimodal emergency messaging is classified in two key types of communications. These types are mentioned in NFPA 72 Chapter 24 as "one-way" and "two-way" emergency communication. Mass Notification should use all type of devices which supports audio, text, and multimedia to provide information and instructions to people

who may be impacted by an emergency incidents.

To achieve fast and effective delivery of messages/audio regarding emergency situation, ranging from terrorist attacks to advertisement message of new sell in city, required the cooperation of local broadcasters. In the USA for example, the CONELRAD (Control of Electromagnetic Radiation) system in cooperation with local broadcasters system was implemented. It utilized two modalities, television and radio. CONELRAD evolved into the Emergency Broadcast System (EBS) and the Emergency Alert System (EAS).

following 9/11 terrorist attack federal governments across North America realized that EBS and EAS had specific weaknesses. For example; recipients of mass notifications system may or may not be always present within the range of local broadcasting agencies like radio.

Hence it is always better to provide the most reliable solutions by layering multiple forms of communications e.g mobile phones, sms, emails, pager or even social media during emergency situations. For example, in 2006; as part of the emergency broadcasting evolution, the Commercial Mobile Alert System, (CMAS) was developed as another modality to leverage, in the effort to deliver fast and efficient messages to the public via mobile phones.

Today mobile phones, and social media like facebook and twitter have become an industry reality. A wide-ranging web-based multi-modal net-centric alerting solution would utilize social media, mobile phones as one layer of broadcast media dependant on the information technology portals available. We know that web-based notifications just like Facebook or twitter often will not provide the desired level of trustworthiness for communication with recipients especially during heavy earthquake such as Nepal earthquake (2015) or heavy flood situation like 2014 in Jammu and Kashmir, when internet connection go slow down or disrupt. Since this presents a serious problem, the layered approach requires that we leverage the higher reliability systems such as Underwriters Laboratories (UL) listed fire alarm/emergency communication systems.

The higher reliability layer consists of the use of the fire alarm/emergency communication systems. These systems provide live and pre-recorded intelligible voice messages via interior and exterior hardwired and supervised speakers and visual strobe signal appliances..

3 KEY POINTS TO REMEMBER

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 premises of a facility, such as high-noise locations like airport, audible alarms may not be adequate. Devices such as signaling device, sirens, public address systems, intercoms, twinkle/flash lights, etc., can be used for site notification depending upon the size of the Planning and Developing Effective Emergency Mass Notification Strategies for Hazardous Industrial Applications site and the variety of potential emergencies. Mass Notification systems may differ from single-signal units to multifunctional/code series systems. If a code system is working, all recipient users or Mass Notification system need to be aware of the

a range of standard or codes and what they symbolize. 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.

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.

Easy to Use and Manage

Choose a Incident template(preconfigured with message and recipients in it) from click once button and click a button. It's that easy. The triggered incident/alert will configured with the messages, recipients, escalation rules, text, audio, multimedia content and options that you pre-defined. You can modify the alert before it's sent or create one from scratch. Unlike many mass notification systems, administration overhead is low, freeing your team to be more productive

One point remains clear

A mass notification system cannot afford to leave any recipients uninformed of an emergency situation. Consequently, in addition to alerting all inside, outside recipients. 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

Outdoor Areas

The same principles also pertain to designing intelligible systems for outdoor areas; however, there are additional parameters to consider such as wind, temperature and humidity, as well as the changing of the environment due to seasons, age

and time.

4 CONCLUSION

Over the past decade, mass notification systems have changed noticeably for informing and protecting the public. Their proven effectiveness in alerting communities has been illustrated in a wide variety of critical events across all geographic regions.

The research presented here explains important of code of conduct/ standards like NFPA for Mass Notification system. It is very important to keep Mass Notification System easy to communicate, simple to understand, easy to use and manage. Clearly Mass notification system, the manners in which these systems are deployed and used are transitioning. Yet, what is not changing is the need for better communication and interaction with the people in times of crisis. Citizen expectations regarding information are growing, not shrinking. As such, emergency notification will continue to play an important, expanding role in protecting and serving the public.

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