



Mass Notification “ECS”

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Mass Notification Agenda

- Definition
- Events History
- Code Requirements
- Latest Code Changes - Overview
- Mass Notifications Systems – Equipment
- Funding
- Planning Outline

Mass Notification Definition

- Mass Notification

- Capability to provide real-time information to all building occupants or personnel in the immediate vicinity of a building during emergency situations

- From UFC 4-021-01



Mass Notification Systems

- School Safety
 - Evacuate/Lockdown/Shelter in Place
- Inclement Weather
 - Tornadoes
 - Floods
- Public Security
 - Terrorist Threats
 - Attacks
- Public Health
 - Anthrax
 - Bioterrorism
- Military
- Power Outage
- Systems Loss
 - Banking
 - Stock Markets
 - Commodity
 - Currency
- Municipal/County/State
 - Water Contamination
 - Food Safety
 - Crime Suspects
 - Amber Alerts

Mass Notification History Events

- Oklahoma Federal Courthouse Car Bomb April 1995
 - 168 deaths, including 19 Children
- Khobar Towers attack Saudi Arabia June 1996
 - 20 deaths 372 wounded
 - No plan in place to minimize loss of life
- Atlanta Olympics bombing 1996 (Eric Rudolph)
 - 2 deaths 150 wounded
- 911 New York City (multiple attacks) 2001
 - 2749 deaths unrecorded # wounded
 - No plan in place to minimize loss of life
- Boston Marathon bombings April 2013
 - 3 deaths 274 wounded
- “40 foiled attacks since 911”Heritage Foundation



Mass Notification History

- Interim DOD Antiterrorism/Force Protection Construction Standard - December 1999
- United Facilities Criteria (UFC) DOD Minimum Antiterrorism Standards for Buildings – July 2002
 - UFC 4-010-01
 - Required MN systems in all DOD facilities by 2007
- DOD UFC 4-021-01
 - “Design and O&M: Mass Notification Systems”
 - Issued December 2002
 - Purpose
 - To provide mass notification in compliance with requirements of UFC 4-010-01, *DOD Minimum Antiterrorism Standards for Buildings*
- http://www.wbdg.org/ccb/DOD/UFC/ufc_4_021_01.pdf

□ **UFC 4-021-01, Design and O&M: Mass Notification Systems, April 9, 2008**

“Mass notification provides real-time information and instructions to people in a building, area, site, or installation using intelligible voice communications along with visible signals, text, and graphics... The purpose of mass notification is to protect life by indicating the existence of an emergency situation and instructing people of the necessary and appropriate response and action.”

□ **NFPA 72, National Fire Alarm and Signaling Code, 2010 Edition**

Section 3.3.79.1.3 In-Building Mass Notification System.

“A system used to provide information and instructions to people in a building or other space using intelligible voice communications and including visible signals.”

Mass Notification Requirements

- May be local or global
- Timely
- Notify occupants that an emergency exists
 - Prerecorded and live
- Provide instructions
 - General
 - Specific to that event**
- Trigger large scale alert to reduce risk of mass casualties

Mass Notification Requirements

- Operate from one or more locations
- Capable of interfacing to wide area systems
- Meet speech intelligibility requirements
 - Common intelligibility scale (CIS)

New ECS Terminology

- Autonomous Control Unit (ACU)
 - Controls devices and appliances within a building
 - Each building has an ACU
 - Password protected
 - Quickly/accurately deliver prerecorded or live message
 - Monitors and controls NACs
 - Triggered by building occupants via Alert button, fire alarm pull station, etc.

*(per Chapter 24)

Chapter 24 Overview

- NFPA 72, 2010 Edition, Chapter 24
 - Emergency Communication Systems (ECS)
 - Adds Mass Notification requirements to National Fire Alarm Code
 - Requires a risk analysis be prepared
 - Addresses three specific areas:
 - Systems in buildings
 - Wide-area notification
 - Distributed notification
 - Consolidates voice evacuation and mass notification
 - Consolidates two way communication in buildings
 - Information command and control hierarchy


Risk Analysis for Performance-Based Design

ECS Messaging

Message Priority defined by Chapter 24

1. Live message
2. Automatic fire alarm messages
3. Non-fire emergency conditions
 - Weather
 - Gas leaks
 - Chemical spills
 - Other site specific hazards
4. Non-emergency messages

***In Building ACU has Higher Precedence
than Remote Control***



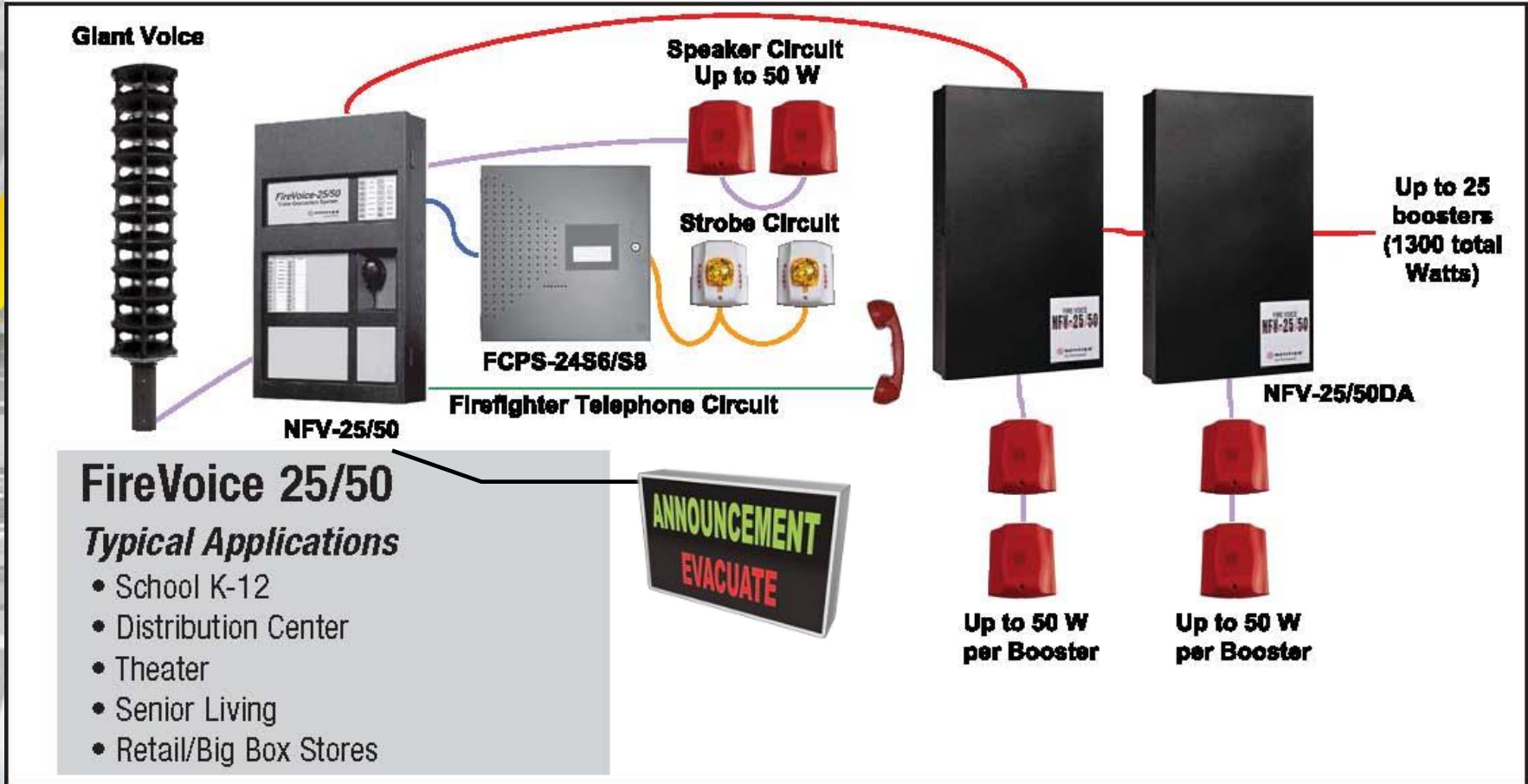
Chapter 24 Emergency Communication Systems

Components

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Small to Mid Size System



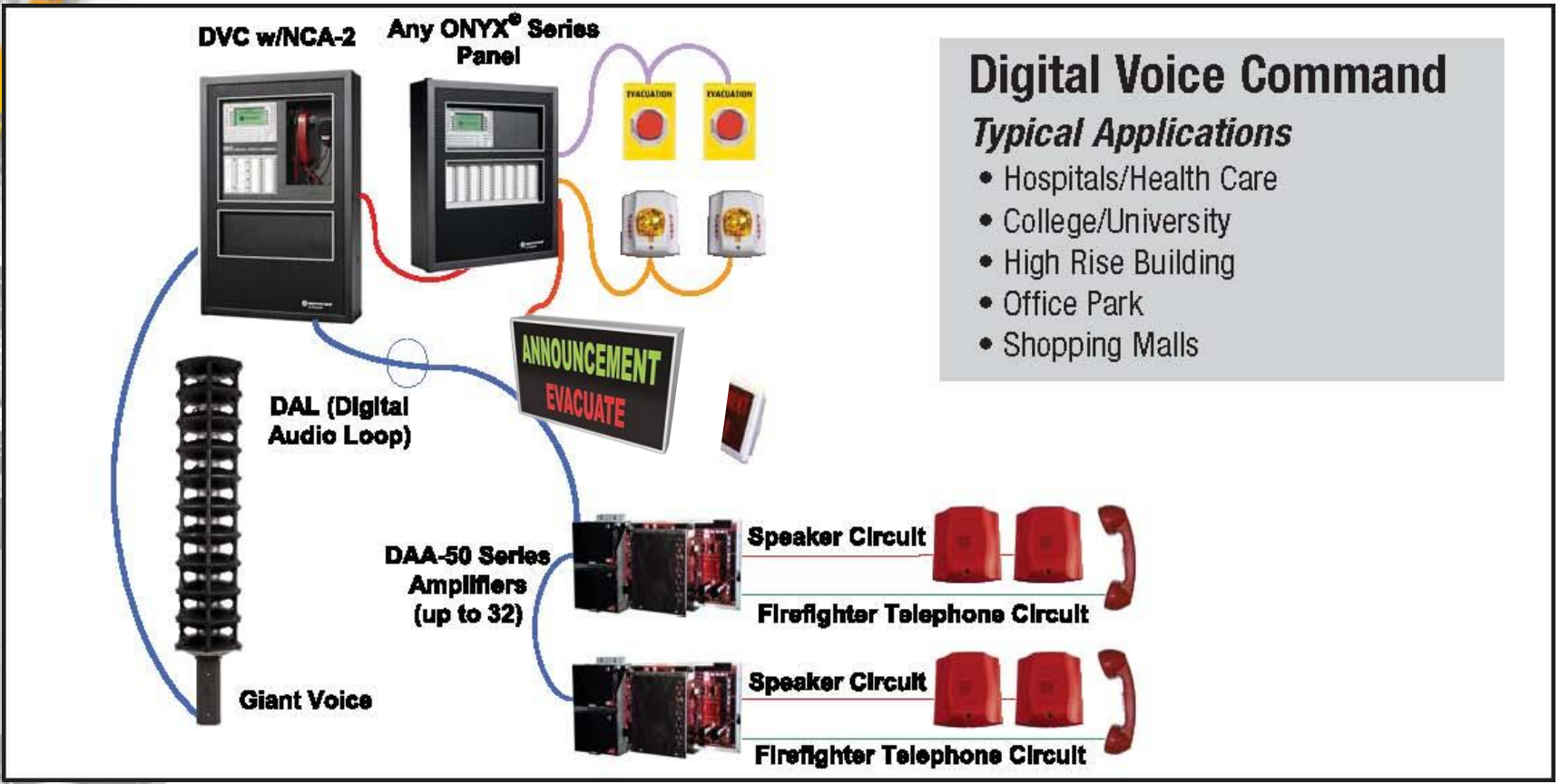
- First Command Voice NFC-50/100 Distributed Audio

- Powerful

- Live Emergency Paging

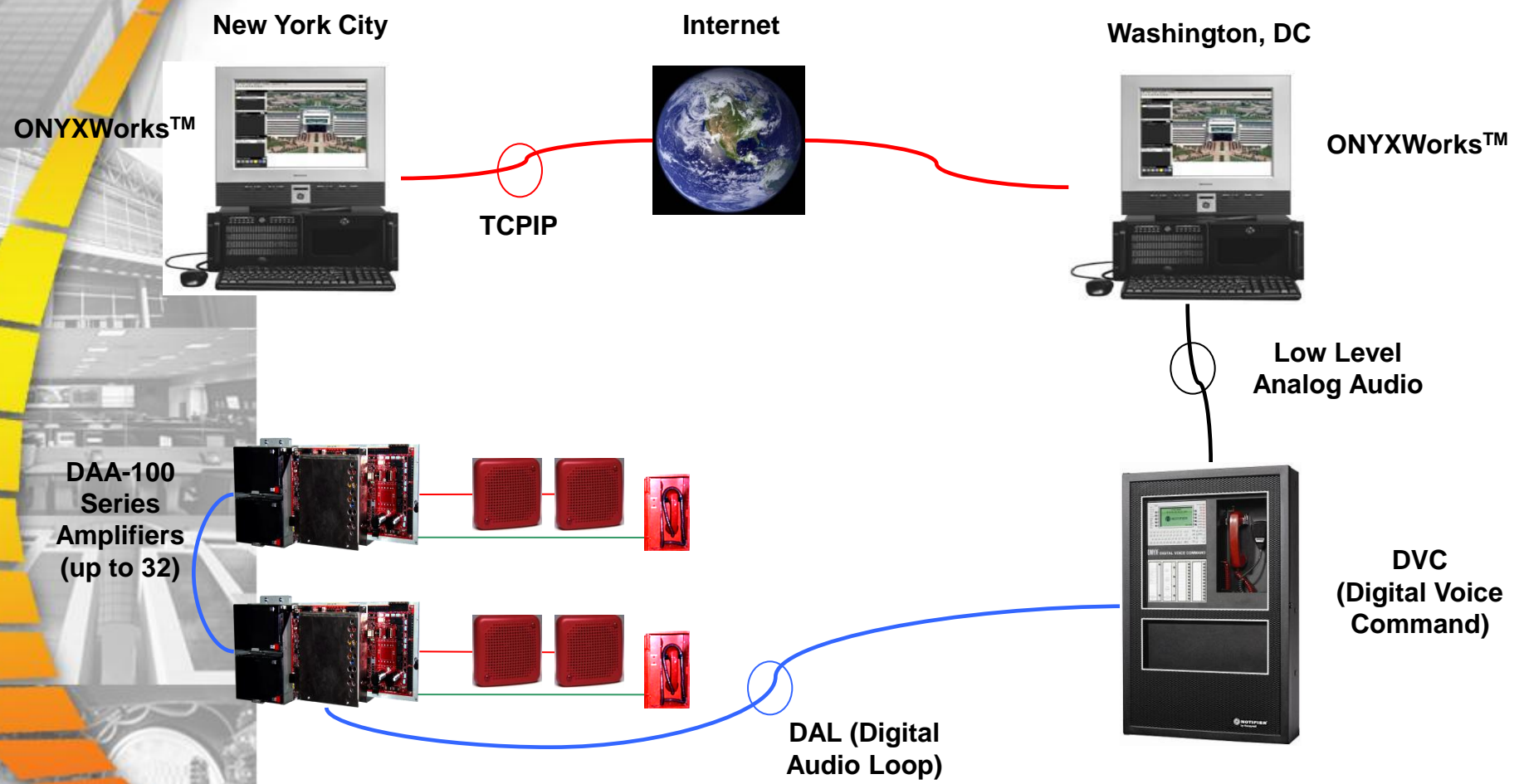
- Firefighter Telephones

Mid to Large Integrated Audio System



- ### Digital Voice Command
- Typical Applications*
- Hospitals/Health Care
 - College/University
 - High Rise Building
 - Office Park
 - Shopping Malls

NOTIFY-IP™ Mass Notification



Distributed Recipient MN Systems

- DRMNS examples:
 - Mass dialing systems
 - Email
 - Text message to cell phones

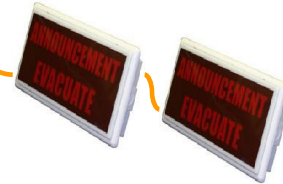


Digital Voice Command

DVC w/NCA-2

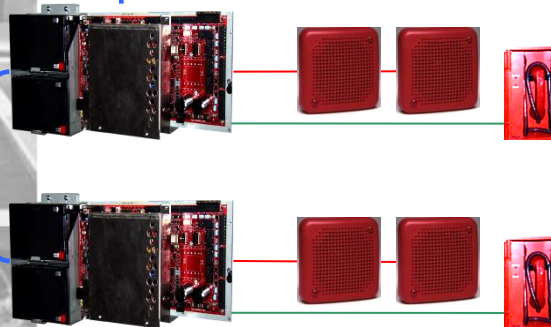


Any ONYX Panel



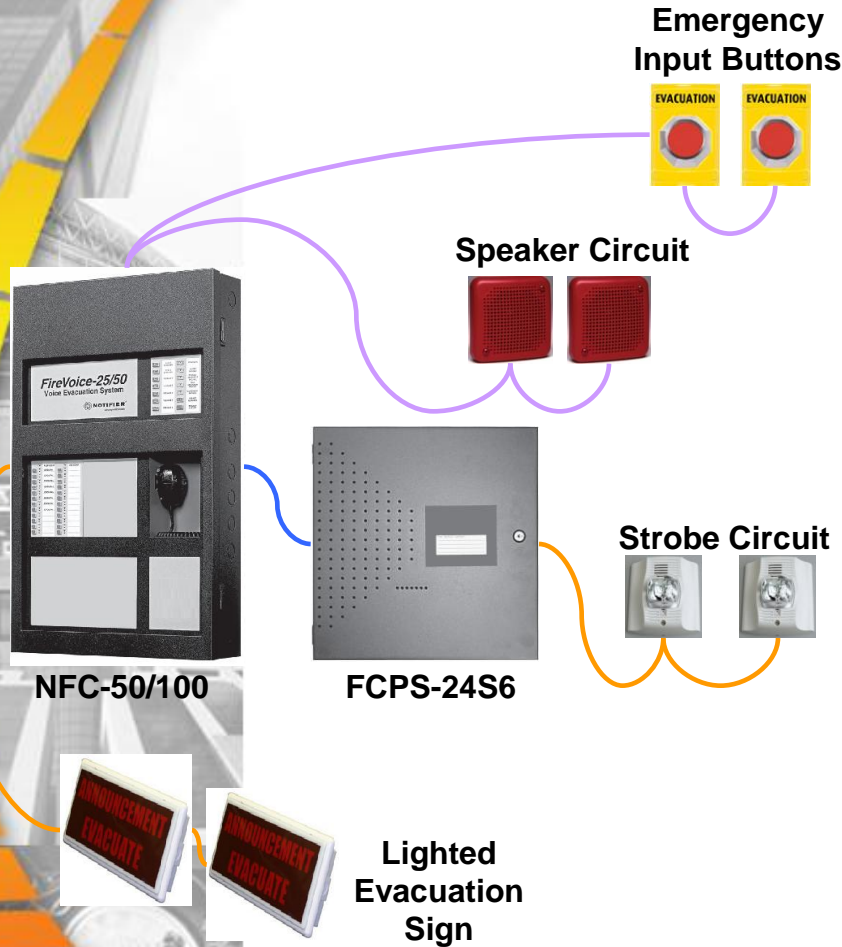
DAL (Digital Audio Loop)

DAA-50 Series Amplifiers (up to 32)



- Powerful Standalone Mass Notification System
- Fiber DAL Capability Allows Many Miles of Coverage
- Telephone Option on DAA-50 Series Delivers Distributed Two-Way Communication
- DAAs can be located throughout a campus

First Command - NFC-50/100



- Up to Eight Command Inputs Can Trigger System
 - Emergency Input Button
 - Security/Fire System
 - NAC Circuit or Dry Contact
- Speaker Circuit Integral
 - Expandable
- FCPS-24S6 Provides Strobe Power
- Aux Power Provided for Lighted Sign
- Remote Microphone Optional

Mass Notification Supplemental Components

- Telephone systems
- Clear or amber strobes
- Horns, giant voice/big voice
- Cell phones and pagers
 - Audio
 - Text
- Radios and wireless
- LED or graphic signs
- Video
- Computer popup or emails



Wide Area (Outdoor) Mass Notification

- Real-time information to outdoor areas
- Live and pre-recorded messages
- Basic requirements similar to ECS in-building
 - Password protected
 - Trained operator
- High powered speaker arrays (Giant Voice)
 - Use where risk analysis requires
 - Intelligible
 - Minimize sound to off site areas
 - Backup power for 7 days + 60 minutes full load operation at end of standby

Mass Notification Systems – Overview

REQUIREMENTS

Requirements for Mass Notification Systems

- Intelligibility vs. Intelligible
- Designer Qualifications

Intelligibility vs. Intelligible

□ NFPA 72, 2010 Edition

- **Section 3.3.125 Intelligibility.** The quality or condition of being intelligible. <Quantitative – measurable quantity>
- **Section 3.3.126 Intelligible.** Capable of being understood; comprehensible; clear. <Qualitative – “go, no go”>
- **A.3.3.126 Intelligible.** The term intelligible is intended to address only the communications channel and the acoustic environment as shown in Figure A.3.3.126. Intelligibility assumes that the talker or recorded voice message is in a language and using words known to the listener. It also assumes that the listener has normal hearing.

Mass Notification Systems – Overview

Designer Qualifications

- Fire Protection Engineer**

- Pass fire protection engineering NCEES exam

- Registered professional engineer**

- 4 years current work experience
- Fire protection, electrical and communication engineering areas

- NICET IV, Engineering Technologist**

- Fire alarm systems
- Low-voltage communications

- WARNING: Know your branch of service!**

- Navy only accepts fire protection engineer

Mass Notification Systems – Design

AUDIBILITY

Requirements – *cont.*

- **International Building Code, Section 907.9.2 (2006 Edition)**
Same requirement as NFPA 72, only there is a minimum sound pressure level (SPL) of 60 dBA in all occupancies except R and I; these have 70 dBA minimum SPL.
- **UFC 4-021-01, Section 4-6.1 Notification Appliance Network**
“Provide speakers at all locations inside a building where the building fire alarm must be audible.” (i.e. follow NFPA 101 and 72 requirements).

Mass Notification Systems – Design

INTELLIGIBILITY

Design Information

■ Intelligibility Solutions

- Minimum 8 dBA signal-to-noise ratio
 - Move speaker closer to listener; lower watts; lower reverberation
- Minimize reverberation
 - Speakers closer together and lower watts
 - Apply acoustic treatments (e.g. carpet, ceiling tile, wall finishes)

■ **COMMON THEME: More speakers; lower watts**

Funding Sources

- Emergency Response Plans for School Safety Initiative

- www.ed.gov/emergencyplan

- Dept of Education grant to strengthen and improve school crisis plans

- School must write grant application

- Emergency Response and Crisis Management grants (ECRM)

- <http://www.ed.gov/fund/grant/apply/appforms/appforms.html>

Planning Outline

- Research providers, products, experience & staffing
- Examine current & future security initiatives & plans
- Conduct a security risk assessment. (FDLE)
- Review current equipment & growth infrastructure
- Determine Command Center & back up locations
- Develop internal team & leader
- Develop response plan & cost assessment
- Research funding options
- Develop security plan & procedures
- Develop installation & training plan
- System testing & acceptance



Thank you for staying awake!

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