Mass Notification Systems
Requirements and Trends
Tragic Events in Canada

École Polytechnique Massacre
December 6, 1989
Montreal, Quebec
Death(s) 14 Dead + perpetrator
Injured 14

The “first” major terrorist attack in Canada

Dawson College
September 13, 2006
Montreal, Quebec
Death(s) 1 Dead + perpetrator
Injured 19

Better planning minimized the loss of life
The World Trade Center

February 26, 1993
New York City, New York
Death(s) 6
Injured 1042

Control room abandoned due to smoke
Cell phones effective communication

September 11, 2001
New York City, New York
Death(s) 2973 & 19 perpetrators
Injured 6000+

Voice enabled fire alarm used to communicate
Cell phone channels overloaded
Virginia Tech has become the ‘poster child’ for MNS

**Virginia Tech Campus**
April 16, 2007
Blacksburg, Virginia
Death(s) 32 + perpetrator
Injured 61

“Poster Child” for MNS

Highlighted the need for communicating to large groups of disperse populations in critical, time sensitive situations

Drove a sense of urgency

$11 Million class action lawsuit ++
Non Terrorist related needs

**Sunrise Propane incident**
August 10, 2008
Downsview, Ontario
Thousands of people evacuated
1 employee died
1 Fire fighter died (heart attack)
$1.8 million clean up

**City of Vaughan Tornado**
August 20, 2009
Vaughan, Ontario
Thousands of people evacuated
Mass Notification Defined

**Mass** – Directed at or reaching a large number of people.

**Notification** – The act or instance of “making known.”

**Mass Notification System** – A system used to provide information and instructions to people in building(s) or other space using intelligible voice communications and including visible signals, text, graphics, tactile, or other communication methods.

**Emergency Communication System** – A system for the protection of life by indicating the existence of an emergency situation and communicating information necessary to facilitate an appropriate response and action.
Effective Emergency Communications

**Inform or Notify** – Target population and key personnel are alerted to WHAT is happening and WHERE it is occurring.

**Provide Instruction** – Notification is only effective if it gives direction on how to act or what to do and when.

**Verify** – Critical communications require verification that messages are heard, understood and acted upon.

**Repeat** - Most people need to hear a message 3 times before they react to it.
Reach them all!

Truly effective communication is about more than getting the message out; it’s about ensuring the message gets through. So no matter where people are, you need to reach them all.

There are 4 Tiers of Mass Notification Systems:
1. Immediate and intrusive alerting
2. Personal alerting
3. Public alerting
4. Locally relative alerting

Include at least 2 forms of communication, one from Tier 1 and a secondary method from one of the other Tiers to provide a reliable and robust solution.

“A Mass Notifications System can be a system of systems.”
– Wayne Moore, Hughes Associates Inc.
Contact Potential

Maximize contact potential by layering communications, employing multiple technologies and communication modalities.
Mass Notification Activity

Customer

Industry Providers

Regulatory Agencies
Owners and managers are being pressured to install a MNS system NOW

- Political Pressures
  - Stakeholder Concerns
  - Public Relations

- Fiscal Responsibility
  - & Budget Constraints

- Code Compliance
  - & Enforcement

- Tragic Current Events
  - EG: 911, Virginia Tech

- Liability Concerns
  - & Risk Management

- Traditional mission
  - to provide a safe
  - work, learning, living
  - environment

Owner

Urgency
to Develop an
Emergency
Response Plan
Status of Industry Response

 Evolving discussion continues to define the market

 Potential providers positioning their respective offerings

 Some leading with their particular product or strength:
   Fire alarm companies presenting a fire alarm solution
   Security companies presenting a security solution
   Communication companies presenting a communication solution
   Technology companies approaching solely as integrators

 Some opportunistically entering the market

 Few companies will be long-term players:
   Large companies re-visit strategic fit over time
   Small companies may not be around
Unified Facilities Criteria (UFC 4-021-01)

The US Department of Defense developed the UFC specifically to address terrorist events on US military bases.

Although a useful reference document, it has no legal jurisdiction in Canada.
UL2572

Control and Communication Units for Mass Notification Systems

- Bench standard issued as interim listing in response to industry and public need for a MNS equipment listing (August 2008).
- Originally intended as a set of requirements for connecting an external audio input to a Fire Alarm System.
- Addresses testing, construction, product markings, and installation requirements as well as confirmation of operation.
- Standards Technical Panel formed to create a formal document – (target June 2009).
- Issued for public review.
- ULC invited to appoint a “guest” (non-voting) member with a goal of following up with a Canadian version.
UL 2572 – Public Review

Scope Creep:

- In-building Mass Notification System
- Wide-area Mass Notification System
- Distributed Recipient Mass Notification System
- Targeted Recipient Equipment
- Software
- Interfaces
- Combination Systems

Target 2010?
2011?
ULC Committee on Fire Alarm & Life Safety Equipment and Systems, Annual Meeting - May 2009

Accepted a New Work Item proposal for the creation of ULC-S576 - Mass Notification System Communication and Control Units

Formed new ULC Working Group under ULC Subcommittee on Control Units

Appointed Working Group Chair as the ULC Committee representative to UL 2572 STP (Mass Notification System Communication & Control Units)

Work on ULC-S576 will begin when the “dust settles” on UL 2572
Mass Notification will bring changes to:

- CAN/ULC-S525 Audible Signal Devices for Fire Alarm Systems, Including Accessories
- CANULC-S526 Visible Signal Devices for Fire Alarm Systems, Including Accessories
- CAN/ULC-S541 Speakers for Fire Alarm Systems, Including Accessories

And later to:

- CAN/ULC-S524 Installation of Fire Alarm Systems
- CAN/ULC-S536 Inspection and Testing of Fire Alarm Systems
- CAN/ULC-S537 Verification of Fire Alarm Systems

And possibly

- Proposed CAN/ULC-S573 Installation of Ancillary Devices
National Building Code

- 2010 edition expected in November
- Mass Notification not included
- Next (cycle 2013) has begun – MNS on the agenda
- Based on NFPA 72 2010?
Highlights

- Embraces a more broad ‘All Hazards Approach’ to addressing emergency communication including but not limited to fire, terrorist activities, other dangerous situations, accidents, and natural disaster

- Requires intelligible voice messages

- Mass notification messages allowed to over-ride fire alarm notification if supported by the Risk Analysis and approved by the AHJ.

- Emphasizes Performance-based design – and Survivability of the system

- Ancillary functions including the use of the system for general paging, and other non-emergency functions are permitted provided they don't interfere with emergency performance requirements.

- 24.3 3.1 Non required emergency communication systems must meet the requirements of this chapter.

To get the full breath of the design and applications details within this new edition, would require 2 to 3 days of classroom training.
In addition to updated requirements for in-building fire emergency voice/alarm systems this new chapter includes first-time provisions for:

- In-building Mass Notification Systems
- Wide-area MNS for locations such as college campuses
- Distributed recipient MNS to communicated with targeted individuals or groups
- Risk analysis requirements for the design of mass notification systems
In Building Mass Notification Systems

Inside

- Fire voice speakers
- Flat panel displays
- LED displays
- PA / Intercom
- Network Desktop PCs
- Phone Systems
- Wired and wireless buttons
- Indoor camera systems
Wide Area Mass Notification Systems

Outside

- Sirens
- Outdoor PA systems
- High Power Speaker Arrays
  “Giant Voice” systems
- Outdoor strobes
- Electronic signage
- Emergency call stations
- Outdoor camera systems
Distributed Recipient Mass Notification Systems

24.4.4.1 ... DRMNS shall not be used in lieu of required audible and visible alerting mass notification systems but shall be integrated with mass notification systems whenever possible.

At Your Side
- Pagers
- Cell phones / Smart phones
- Personal E-mails
- IM (Instant Message) Alerts
- Duress Alarms
- Hand-held Radios
- Mass dialing systems
- Laptop Computer pop-ups
“I got the emergency text message 2 days later.”

<table>
<thead>
<tr>
<th>Level 1 (Mobile Text Messaging, Wireless Text Messaging)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Not technically “true” SMS. Basically email to mobile devices.</td>
</tr>
<tr>
<td>- Only 1-way, delivery delays, security issues, spam, server congestion</td>
</tr>
<tr>
<td>- Should not be relied on for emergency situations</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2 (SMS device to SMS device)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 2-way messaging, improvement in delivery and security over Level 1</td>
</tr>
<tr>
<td>- Retail technology - used for messaging between friends and relatives</td>
</tr>
<tr>
<td>- Messaging companies do not use level 2.</td>
</tr>
<tr>
<td>- Many do use Level 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 3 (Commerce Transactions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Speed, accuracy, and reliability is of utmost importance for carriers. Highest care taken.</td>
</tr>
<tr>
<td>- 1-to-many, 2-way, premium cost – mostly offered as a subscription</td>
</tr>
<tr>
<td>- Level 3 messages have delivery priority over Levels 1 and 2</td>
</tr>
</tbody>
</table>
Messages

Must provide the following content:

- Information on the hazard and the danger
- Guidance on what people should do (leave or take cover)
- Description of the location of the risk or hazard
- An idea of when they need to act (immediately or within the hour)
- The name of the source of the warning (who is issuing)

Inform – Instruct – Verify – Repeat
Risk Analysis for Mass Notification Systems

24.4.2.2.1 “Each application of a mass notification system shall be specific to the nature and anticipated risks of each facility for which it is designed.”

- Consider both fire and non-fire emergencies
- Performance-based design and risk analysis
- Risk analysis shall be used as the basis for development of the Emergency Response Plan
A 24.4.2.2.1 Basic Questions that should be addressed

1. What is the type of the emergency event?
2. What is the urgency of the emergency event?
3. What is the anticipated or expected severity of the emergency event?
4. What is the certainty of the event (past, present, future or unknown)?
5. What is the location of the event or from what direction?
6. What zones or areas should receive the emergency message(s)?
7. What is the validity of emergency event?
8. What instructions should be sent?
9. Are there any special instructions, procedures, or special tasks to be accomplished (e.g. close doors, stay away from windows, do not use elevators)?
Emergency Response Plan Elements

24.4.2.3  …in accordance with NFPA 1600 Standard on Disaster / Emergency Management and Business Continuity Programs and NFPA 1620 Recommended Practice for Pre-Incident Planning…

- Emergency response team structure
- Emergency response procedure
- Emergency response equipment and operations
- Emergency response notification
- Emergency response training and drills

“A good plan today is better than a perfect plan tomorrow.”
George S. Patton
Emergency Response Planning Process

- Gather information on existing procedures, personnel & equipment
- Identify specific needs
- Anticipate the unexpected
- Gap analysis - Desired versus Current state
- Consider the cost of doing nothing
- Prioritize plan execution - customer specific concerns determine levels of priority:
  - Immediate Needs (Now)
  - Short-Term (6-18 months)
  - Long-Term (2-5 years)
- On-going review and revision of plan over time
- Process requires long-term vision and planning
Challenges

- NOT Technology
- Identifying the decision makers in a facility
- Getting buy in from all stakeholders
- Threat Assessment
- Emergency Action Planning
- Financial Impact (Budgeting)
- Phased implementation (Master Planning)
- Ongoing evaluation (perpetual integration)
- Long term support
For additional information

National Fire Protection Association
  ▪ [http://www.nfpa.org](http://www.nfpa.org)
  or Annex Publishing and Printing
  ▪ [http://www.annexbookstore.com](http://www.annexbookstore.com)
  ▪ **NFPA 72** National Fire Alarm and Signaling Code (2010)
  ▪ **NFPA 1600** Standard on Disaster / Emergency Management
    and Business Continuity Programs
  ▪ **NFPA 1600** implementing National Preparedness Standard
  ▪ **NFPA 1620** Recommended Practice for Pre-Incident Planning

Campus Safety Magazine
  ▪ [http://www.campussafetymagazine.com](http://www.campussafetymagazine.com)

Manufacturers Web Sites
Thank you!

Reach Them All
Questions?

don.boynowski@siemens.com