DEPARTMENT OF GENERAL SERVICES

Division of Engineering & Buildings

DEB Newsletter

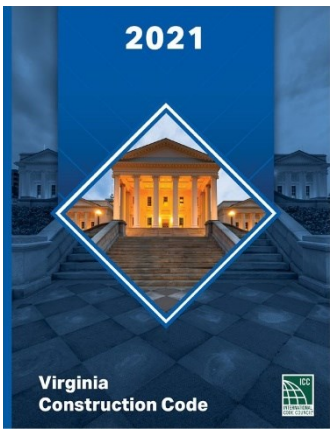
#83

FALL 2024

Mass Notification Systems and Risk Analysis

One of the most critical aspects of any emergency response plan is communication. Ensuring that the right people receive the right information at the right time and in the right format is key to achieving a favorable outcome. A Mass Notification System (MNS) is a tool that is often employed by property owners to meet this objective. In a world of constantly developing technology, mass notification systems no longer consist simply of a large broadcast speaker mounted to a tower (although they still do at times). MNS communication may result in a text message on a cell phone. It could be an email received by select individuals. It may be accomplished by speakers distributed throughout a building or campus. In all cases, the goal is to transmit important information and/or instructions to specific recipients in response to a particular emergency.

Beginning in the 2018 edition of the Virginia Construction Code (VCC), provisions were introduced to establish a benchmark for the consideration of mass notification systems in new buildings. The word "consideration" is used intentionally here, because the VCC does not explicitly require a MNS to be installed. Under certain scenarios it does require the need for MNS communication to be explored. This requirement as stated in 2021 VCC Section 917.1 is as follows:



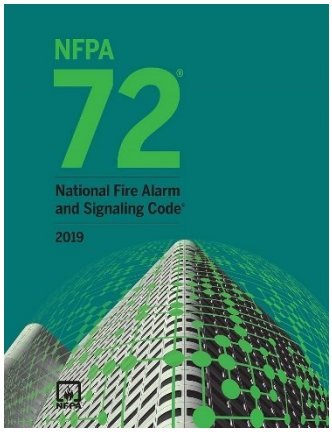
"Prior to construction of a new building requiring a fire alarm system on a multiple-building college or university campus having a cumulative building occupant load of 1,000 or more, a mass notification risk analysis shall be conducted in accordance with NFPA 72. Where the risk analysis determines a need for mass notification, an approved mass notification system shall be provided in accordance with the findings of the risk analysis."

Notice the underlined portions of this section. From a building code standpoint, a MNS only needs to be considered for new buildings on college or university campuses that require a fire alarm system (ref. VCC Section 907.2 and 2024 CPSM Rev 0 Section 4.1.2.1) and result in a cumulative occupant load of 1,000 or more. The cumulative occupant load is intended to account for all buildings on campus. Even if a new building meets these criteria, a MNS is still only required to be provided when the risk analysis indicates the need for one. Herein lies a point of much confusion for

Also in this issue:

designers and building owners. What is a risk analysis? What does it include? Who prepares it? First, a definition of a "risk analysis" can be found in 2019 NFPA 72 Section 3.3.253 and is as follows:

"A process to characterize the likelihood, vulnerability, and magnitude of incidents associated with natural, technological, and manmade disasters and other emergencies that address scenarios of concern, their probability, and their potential consequences."



Simply stated, a risk analysis is an assessment of potential emergency scenarios.

Various parties, or stakeholders, will have an interest in any risk analysis, including the owner or owner's representative, a licensed design professional (particularly for performance-based designs), the authority having jurisdiction, first responders, and others. In order to get the ball rolling, it may be prudent to complete a basic checklist to identify all potential assets and/or operations that may be at risk and to determine the potential hazards. NFPA 72 Figure A.7.3.6 is an example of such a checklist, which could be initiated by the building owner at any time to begin to lay the groundwork of the risk analysis.

RISK ANALYSIS CHECKLIST

Facility name: _____ Facility location: _____
Prepared by: _____ Date prepared: _____
Title and contact information: _____
ECS system type: _____

PART ONE: Identification of Assets or Operations at Risk
Use Part One of this checklist to identify the following assets or operations at risk at your facility

❑ **People**
- ❑ Employees
- ❑ Visitors and guests
- ❑ Contractors working on site
- ❑ Emergency responders
- ❑ Community surrounding the facility

❑ **Property**
- ❑ Physical property
  - ❑ Corporation offices
  - ❑ Manufacturing facilities
  - ❑ Call center
  - ❑ Distribution centers
  - ❑ Date-processing center
  - ❑ Research and development labs
  - ❑ Property on the premises of others
  - ❑ Vital papers, records, and drawings
- ❑ Intellectual property
  - ❑ Copyright and patent infringement
  - ❑ Trademark infringement
  - ❑ Theft of intellectual property
  - ❑ Theft of information
- ❑ Utilities
  - ❑ Telecommunications
  - ❑ Electricity
  - ❑ Water
  - ❑ Gas
  - ❑ Steam
  - ❑ Heating/ventilation/air conditioning
  - ❑ Pollution control
  - ❑ Sewerage system
  - ❑ Other critical infrastructure
- ❑ Computers and computer networks
  - ❑ Software applications
  - ❑ Electronic data
- ❑ Inventory
  - ❑ Raw materials
  - ❑ Finished product

❑ **Operations**
- ❑ Manufacturing processes
- ❑ Delivery of services
- ❑ Administrative support services
- ❑ Research and development
- ❑ Supply chain

❑ **Environment**
- ❑ Air
- ❑ Water
- ❑ Ground

❑ **Organization**
- ❑ Economic and financial condition
- ❑ Licenses, patents, or trademarks
- ❑ Reputation and image as well-managed company
- ❑ Contractual obligations
- ❑ Community relationships
- ❑ Regional and national impact
- ❑ Regulatory compliance and relationships with vendors

 NFPA 72 (p. 1 of 2)

RISK ANALYSIS CHECKLIST *(continued)*

PART two: Determination of Facility Hazards
Use Part Two of this checklist to determine the potential hazards that may impact your facility

❑ **Natural Hazards—Geological**
- ❑ Earthquake
- ❑ Tsunami
- ❑ Volcano
- ❑ Landslide, mudslide, subsidence
- ❑ Glacier, iceberg

❑ **Natural Hazards—Meteorological**
- ❑ Flood, flash flood, tidal surge
- ❑ Drought
- ❑ Windstorm, tropical cyclone, hurricane, tornado, water spout, dust/sand storm
- ❑ Extreme temperatures (heat, cold)
- ❑ Lightning strikes
- ❑ Famine
- ❑ Geomagnetic storm
- ❑ Snow, ice, hail, sleet, avalanche

❑ **Natural Hazards—Biological**
- ❑ Diseases (pandemic)
- ❑ Animal or insect infestation or damage

❑ **Human-Caused Accidental Events**
- ❑ Hazardous material (explosive, flammable liquid, flammable gas, flammable solid, oxidizer, poison, radiological, corrosive) spill or release
- ❑ Natural gas leak
- ❑ Nuclear power plant incident
- ❑ Hazmat incident off site
- ❑ Explosion/Fire
- ❑ Wildfire (forest, range, urban, wildland, urban interface)
- ❑ Transportation accident (motor vehicle, railroad, watercraft, aircraft pipeline)
- ❑ Building/structure failure or collapse
- ❑ Entrapment
- ❑ Mechanical breakdown
- ❑ Energy/power/utility failure
- ❑ Fuel/resource shortage
- ❑ Air/water pollution, contamination
- ❑ Water control structure/dam/leveel failure
- ❑ Communications systems interruptions
- ❑ Financial issues, economic depression, inflation, financial system collapse
- ❑ Misinformation

❑ **Human-Caused Intentional Events**
- ❑ Terrorism (explosive, chemical, biological, radiological, nuclear, cyber)
- ❑ Sabotage or vandalism
- ❑ Civil disturance, public unrest, mass hysteria, riot
- ❑ Enemy attack, war
- ❑ Insurrection
- ❑ Strike or labor dispute
- ❑ Demonstration
- ❑ Disinformation
- ❑ Criminal activity (vandalism, arson, theft, fraud, embezelement, data theft)
- ❑ Electromagnetic pulse
- ❑ Physical or information security breach
- ❑ Sniper incixdent
- ❑ Crime, theft, or robbery
- ❑ Product defect or contamination
- ❑ Harassment
- ❑ Arson
- ❑ Bomb threat
- ❑ Lost person
- ❑ Child abduction
- ❑ Kidnap
- ❑ Extortion
- ❑ Hostage incident
- ❑ Workplace violence

❑ **Technological-Caused Events**
- ❑ Telecommunications
- ❑ Central computer, mainframe, osftware, or application (internal/external)
- ❑ Energy/power/utility
- ❑ Ancillary support equipment

 NFPA 72 (p. 1 of 2)

Recall from the charging VCC section above for MNS consideration that only buildings requiring a fire alarm system trigger the need for a MNS risk analysis. In most buildings, a fire emergency is considered to be the primary threat to building occupants. Accordingly, the vast majority of NFPA 72 is dedicated to fire alarm system installation and performance. Mass notification systems are unique in that they are often designed to address multiple types of hazards in addition to fire emergencies. In fact, the same equipment used to process fire alarm signals may

DEPARTMENT OF GENERAL SERVICES

DEB Newsletter
#83 Fall 2024

Contact Us
1100 Bank Street, 6th Floor
Richmond, VA 23219
Phone: 804-786-3581
Fax: 804-225-4709
Email: CapOut@dgs.virginia.gov

Quick Links
- BITS
- Budget Development
- CPSM
- CPSM & VCCO Training
- DEB Contacts
- DEB Home Page
- DEB Notices
- Documents & Forms
- Electronic Document Review (EDR)
- Permits & Certificates

The DEB Newsletter is a quarterly publication of the Department of General Services' Division of Engineering & Buildings. Prior Newsletter issues are available on the DEB Newsletter webpage.

To subscribe, visit the self service DEB Newsletter Subscription webpage.

also be used as part of the MNS. One chief concern of the risk analysis is to understand the hierarchy of signals and messages being handled by the MNS and to ensure that the more critical ones are not compromised by those deemed to have a lesser significance.

A licensed design professional can help the building owner and other stakeholders navigate these decisions from a technical standpoint and ensure that the MNS functions as required by the collaborative risk analysis. Therefore, it is important that the risk analysis be sufficient in detail to convey the multiple levels of responsibility and communication so that it can be translated into an actual design. Additional guidance can be found in NFPA 72 Section 24.3.12 (Risk Analysis for Mass Notification Systems) and Section 24.12 (Performance-Based Design of Mass Notification Systems). These sections provide insight into the thought process, various design considerations, goals, and objectives of the risk analysis process.

Since the risk analysis ultimately sets the stage for the MNS design, a written report of the findings must be submitted to the Division of Engineering and Buildings with the Working Drawings phase of a project. Should the risk analysis require a mass notification system, the drawings and specifications must present enough detail to clearly convey the design intent. Keep in mind that systems responsible for fire risks are listed accordingly, such as Emergency Voice/ Alarm Communications Systems (EVACS). Non-fire mass notification systems that are addressed in NFPA 72 Section 24.5 (In-Building MNS), NFPA 72 Section 24.6 (Wide-Area MNS), and NFPA 72 Section 24.7 (Distributed Recipient MNS) may be able to be combined with an EVACS only when listed accordingly or connected by a listed interface.

Updated Procedures Adopted by the Secretary of Administration for Construction Management and Design-Build

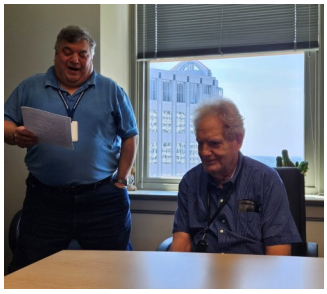
New procedures for the Construction Management at Risk and Design Build Procurements were adopted to reflect changes in the Code of Virginia. These Procedures can be found on the DEB Website.

John Whitfield 50 year Anniversary

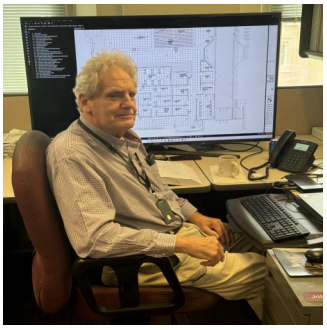
DEPARTMENT OF GENERAL SERVICES
DEB Newsletter
#83 Fall 2024

John M. M. Whitfield, P.E. commemorated his 50 years of service to the Commonwealth of Virginia on July 16, 2024.

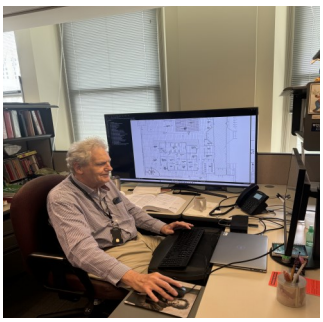
John began his career with the Commonwealth in 1974 as a Deputy State Fire Marshal in the Virginia Office of the State Fire Marshal. After initial plans review training, he served as the Assistant District Engineer for the Richmond District Office. In addition to his plan review duties, John inspected buildings at the University of Virginia, Medical College of Virginia, and Virginia Commonwealth University as well as major places of assembly, hospitals, and seat of government buildings. Following this, he served as the Senior Plans Review Engineer for the State Fire Marshal's Office. During his SFMO career, he developed and taught classes on plans review at the annual Fire Prevention Clinic in Blacksburg.



In 1991, he began working for the Bureau of Capital Outlay Management (now the Division of Engineering and Buildings) as a State Fire Protection Review Engineer. He reviewed documents and conducted construction inspections for many significant and complicated construction projects in his more than 30 years at DEB, including the Virginia State Library, the Virginia Museum of Fine Arts West and North expansions, various Department of General Services buildings, the Virginia Alcoholic Beverage Control Warehouse, and many major Department of Corrections facilities.



John's historical knowledge and insight on code changes throughout the years, from the 1973 VUSBC to the 2021 VCC, are invaluable resources that provide insight for DEB to consistently apply the intent of the code.



In honor of John's service, the DEB conference room is now named the John M. M. Whitfield Conference Room.

John continues his career with the Commonwealth as an instrumental part of DEB's Fire Protection review team, with no immediate plans to retire. You may offer your personal congratulations to John at john.whitfield@dgs.virginia.gov.

VCCO Updates

The following individuals recently passed the Virginia Construction Contracting Officer (VCCO) certification exam:

- **Keola Lee** - Jamestown-Yorktown Foundation
- **Kendra Briscoe** - State Corporation Commission
- **Cassandra Jackson** - Virginia Dept for the Blind & Vision Impaired
- **Rick Begley** - Jamestown-Yorktown Foundation
- **Fayez Dajani** – Virginia State Police

Virginia Construction Contracting Officers are state and local government employees who have completed the necessary training and successfully passed a multi-part examination focused on state procurement law, policy and procedures. VCCOs perform several key functions in delivering projects including the procurement of professional services; the receipt, opening and review of bids; and in some cases the approval of CO-8 forms for recommending the award of construction contracts.

DEPARTMENT OF GENERAL SERVICES

DEB Newsletter
#83 Fall 2024

DEB Forms Updates

The form listings below identify the forms that have been added and describes the forms; revisions to existing forms are detailed in the *DEB Forms Master List*.

Form Name	DGS Form #	Version
DEB-Forms Master List (for more information on revisions)	DGS-30-000	10/24
[NEW!] Commissioning Completion Form	DGS-30-229	10/24
[NEW!] Document Checklist for Final Completion	DGS-30-153	10/24
[NEW!] Project Planner Example	DGS-30-151	10/24