JENSEN HUGHES

Advancing the Science of Safety

PRIVATE MODE NOTIFICATION: A PRACTICAL GUIDE FOR DESIGN AND IMPLEMENTATION

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Speaker Introductions

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Session Summary

- Private mode notification has become standard practice across healthcare facilities in the United States. However, the prescriptive requirements for the design of a private mode fire alarm system are far less specific than those for a public (standard) fire alarm system.
- Private mode is required by the *Florida Building Code* and the *Florida Fire Prevention Code* in health care facilities.
- Private mode designers must have a deep understanding of the code intent which is to provide audible and visible singling only those that are concerned with the implementation and direction of emergency action initiation and procedure.

How do we do this?

Learning Objectives

At the end of this course, participants will be able to:

+ Define the defend in place strategy to understand evacuation procedures as they relate to fire alarm design considerations.

+ Understand private mode fire alarm operation.

+ Identify key design considerations for private mode application.

+ Successfully implement private mode to satisfy life safety and procedural objectives

Agenda


Evacuation Strategy & Procedures

Fire Alarm Notification

Fire Alarm Operation

Key Design Considerations


Fire Drills


Questions

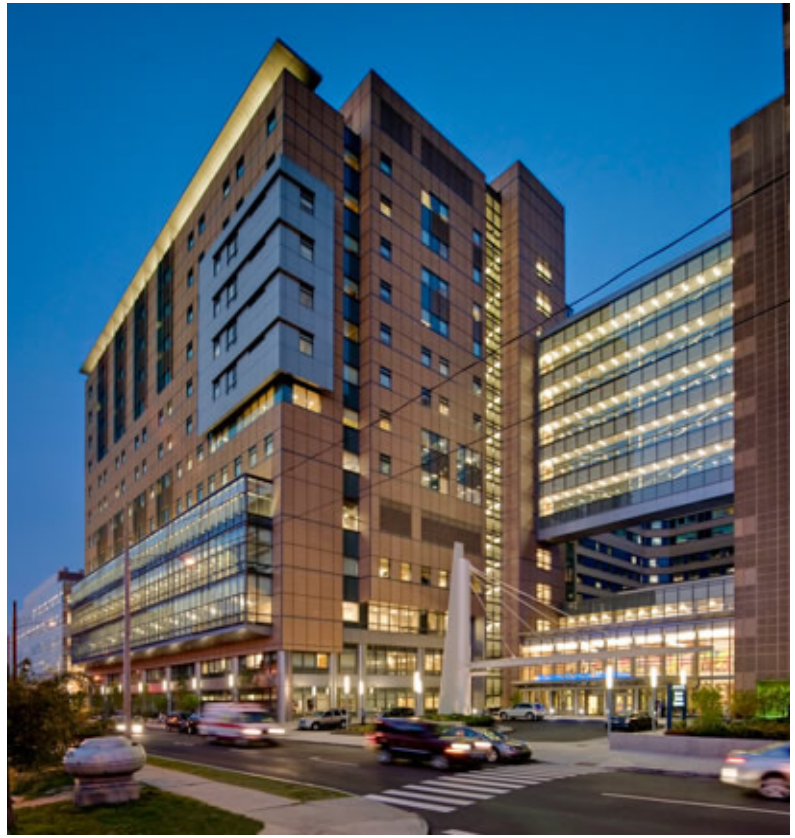
(1)

Evacuation Strategy & Procedures

Life Safety in Healthcare Facilities

Increased levels of protection are required for healthcare facilities

- Higher risk occupants
- Occupants may be incapable of self-preservation
- Increased hazards due to contents
- Unique scenarios presented by procedures and equipment
- Facilities are constantly expanding and reconfiguring to accommodate new procedures / departments / patients

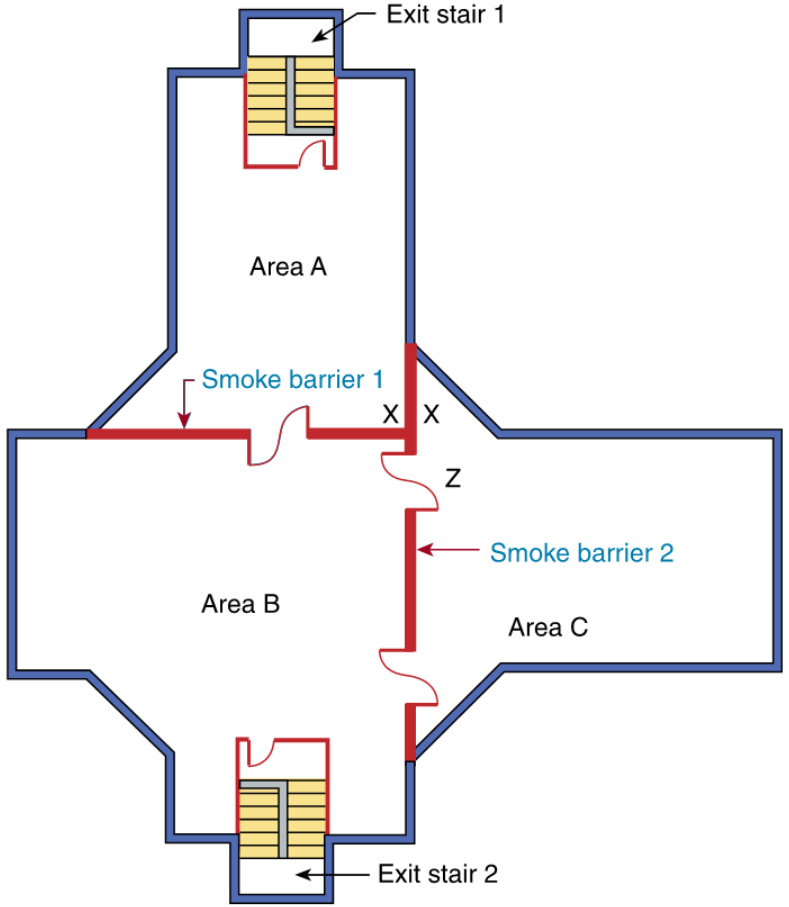


Life Safety in Healthcare Facilities

"Total Concept" approach to life safety

- Safety of occupants cannot rely on evacuation of the building
- Safety of occupants provided by:
  - Appropriate arrangement of facilities
  - Adequate, trained staff
  - Operating and maintenance procedures

Defend-in-Place Strategy



Evacuation in healthcare occupancies involves a defend-in-place strategy

+ Initial response to event does not involve evacuation of the building
+ Facilities rely upon passive construction and active systems to compartmentalize each floor
+ Occupants and patients are relocated from area of immediate danger to safe location on the same floor
+ Requires increased code provisions for fire protection and life safety systems
+ Increased involvement of facility staff members for training, testing and maintenance

Defend-in-Place Strategy

Procedures to effectively implement a defend-in-place evacuation strategy are critical

Typical defend-in-place procedure:

+ **Staff and certain occupants notified of fire event**
+ Staff relocates occupants intimate with fire origin to area of refuge
+ Occupants not in danger due to effects of fire shelter in place
+ Emergency responders address fire

(2)

Fire Alarm Notification

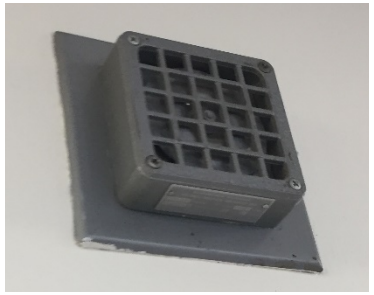
Goals of Fire Alarm Systems

The user of the fire alarm system defines the goals of the system

- Three primary goals:
  - Life safety
  - Property safety
  - Mission protection
- Goals drive system design
  - Type of system
  - Operating mode
  - Components / specifications

Fire Alarm Notification

Intent of fire alarm notification is to provide stimuli for initiating emergency action and provide information to users, emergency response personnel and occupants



- Where the private operating mode is used, notification must include identification of the **zone, area, floor or building** in need of evacuation (2018 edition of NFPA 101 Section 9.6.3.6.3(3))
- Additional means of notification (beyond code requirements):
  - Speakers with coded message, pagers, telephones, etc.

Notification Operating Modes

Public Mode

+ Audible and visible signal is intended for all occupants of the area protected by the fire alarm system

Private Mode

+ Audible and visible signal is intended only for persons directly concerned with implementation and direction of emergency actions in the area protected by the fire alarm system

Zoning

Fire alarm systems (including notification) are subdivided into zones based on:

- *building, story, fire compartment or smoke compartment boundaries*

Notification Zone:

+ The smallest discrete area used for announcements or signaling
+ Bounded by fire safety subdivisions or exterior walls

+ Evacuation Signaling Zone:
  - Dependent on the building/facility's emergency response plan
  - Can encompass multiple notification zones

Typical Evacuation Procedures

1. Fire event detected
2. Trained staff personnel notified and mobilized (applicable zone)
3. Passive construction activated (doors & dampers)
4. Patients in immediate danger prepared and transported by trained staff (applicable zone)
5. Affected patients stabilized once in an area of refuge

During the above procedures:

+ Trained personnel and emergency responders address fire event
+ Patients not intimate with fire event defend-in-place within rated enclosures with doors closed

(3)

Fire Alarm Operation

Public vs Private Mode Operation

Public Mode Typical Operation:

+ Audible and visual alarms in all occupied areas
+ At least 15 dB above ambient noise or voice signal
+ Evacuation begins

Private Mode Typical Operation:

+ Alerts **only** responding staff
+ Audible and visual alarms in staff areas (coded chime/voice message systems)
+ Systems often have a general alarm feature
+ Sound pressure levels 10 dB above ambient with option for AHJ approval of reduction or elimination
+ Notification must identify the zone, area, floor, or building in need of evacuation
+ Fire emergency response begins

Where to Provide Private Mode Notification

- Permitted where occupants are incapable of self preservation
- Typical areas for private mode notification:
  - Patient sleeping rooms / patient care areas
    - Staff is present at all times
    - Notification of the staff from the public areas is possible
    - Patient room fire alarm tone or visuals are not required to alert the staff
    - Guests are best instructed by the staff
  - Operating rooms

Prescriptive Design Requirements

Private Mode Notification – NFPA 72

- Audible and visible signal is intended only for persons directly concerned with implementation and direction of emergency actions in the area protected by the fire alarm system.
- Audible Requirements:
  - 10 dB above the average ambient sound level or 5 dB above the maximum sound level having a duration of at least 60 seconds, whichever is greater (2016 edition of NFPA 72-18.4.4.1).
  - Where approved by the AHJ or other governing codes or standards, the requirements for audible signaling are permitted to be reduced or eliminated when visible signaling is provided in accordance with the requirements of NFPA 72-18.5. (2016 edition of NFPA 72-18.4.4.2).
- Visual Requirements:
  - Sufficient quantity and intensity and located so as to meet the intent of the user and the AHJ (2016 edition of NFPA 72-18.6).

How do these requirements translate into a private mode design?

Prescriptive Design Requirements

Private Mode Notification – Other Codes and Standards

+ Florida Building Code (Section 449)
    - Private mode is required in all inpatient care rooms, spaces, and areas including sleeping, treatment, diagnostic, and therapeutic rooms.
    - “Only the attendants and other personnel required to evacuate occupants from a zone, area, room, floor, or building shall be required to ne notified. Audible and visual notification devices shall only be permitted to be located at the care providers’ stations, the soiled workroom, soiled holding room, clean workroom, staff lounge, medication preparation room, and nurse or supervisor’s office, and other staff rooms or areas as determined by the governing body of the facility.”
+ International Building Code – 2018 edition Section 907.2.6, Group I occupancies
+ NFPA 99, *Health Care Facilities Code (2012 and 2018 editions)*
    - Private operation mode shall be permitted ot be used for the placement of notification appliances within health care and ambulatory health care occupancies of the building.
    - In critical care areas, visual notification shall be permitted in lieu of audible alarm signals.

Prescriptive Design Requirements

Private Mode Notification – Other Codes and Standards

+ NFPA 99, *Health Care Facilities Code (2012 and 2018 editions)… continued*
    - Visual signals not required in surgical operating rooms, patient sleeping rooms, or psychiatric care areas where their operation would interfere with patient treatment.
    - Visual signals not required in exam rooms, special procedure rooms, dressing rooms, and non-public toilet rooms where staff is required to respond to those areas in accordance with the facility fire plan.
+ United Facilities Criteria (UFC) 4-510-01, *Design: Military Medical Facilities*
    - Audible notification shall not be installed within surgical operating rooms and critical care areas or areas where startling the staff or patient due to alarm activation may cause harm to the patient.
    - For facilities with an Emergency Response Plan and trained staff to assist, visible notification appliances are only required in publicly accessible areas (e.g. corridors, lobbies, dining areas, etc.). Visual notification is not required in exam and treatment rooms.

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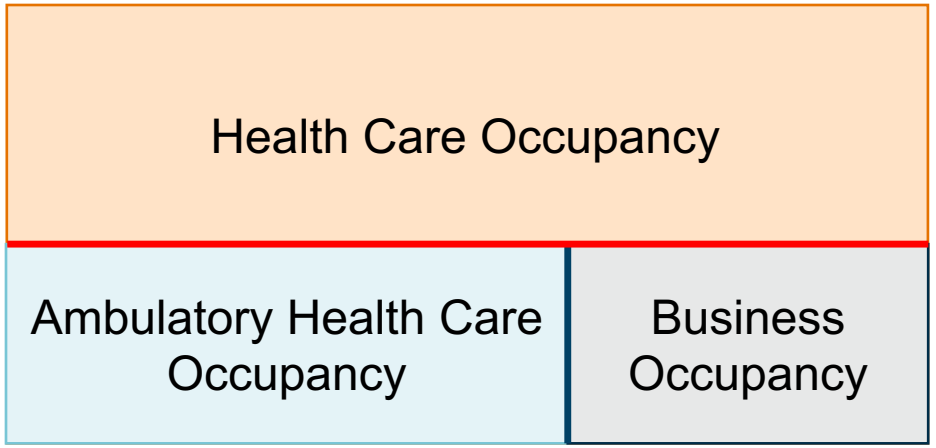
Key Design Considerations

Key Design Considerations

While the objective of private mode notification is relatively simple, there are a multitude of design approaches available to achieve the desired notification goal

- Throughout design, communication with the AHJ and end-user is critical
- Important to minimize patient exposure to the fire alarm signal
- Notification layout must be coordinated with the facility's evacuation plan
- Notification must identify the zone, area, floor, or building in need of evacuation
- Notification approach (public or private mode) is often applied to entire smoke compartment
- Are nurse stations actually occupied 24/7?



Audible Notification Design Considerations

Non-voice system (horns/chime)

- Permitted as long as a voice alarm system is not required
- No information about the emergency event is distributed
- Annunciators at nurse stations will likely be required to ensure the zone, area, floor, or building in need of evacuation is identified
- Consideration should be given to audible alarm signals startling or causing harm to patients

Voice alarm system (speakers)

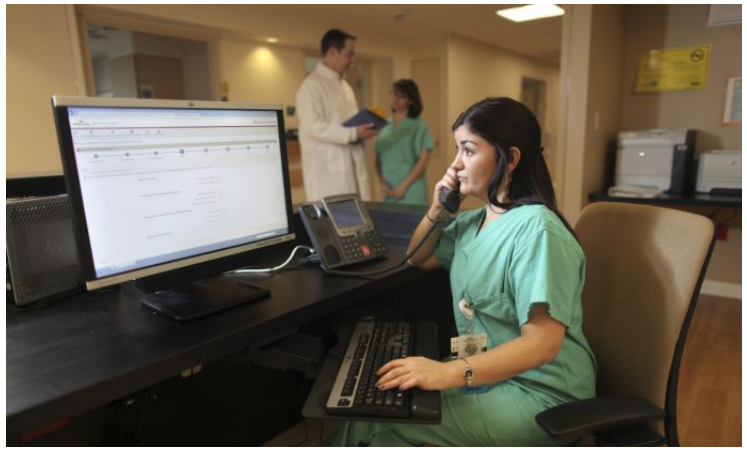
- Allows some (or all) of required information to be distributed to hospital staff via coded messages
  - "Dr. Red is in your area"
  - "Dr. Red is on your floor"
  - "Dr. Red is in the building"
- Live voice paging capabilities
- Annunciators at nurse stations may still be required to ensure the zone, area, floor, or building in need of evacuation is identified

Visible Notification Design Considerations

Sufficient quantity and intensity and located so as to meet the intent of the user and the AHJ

What does that mean?

+ Alert staff of an emergency
+ After initial alert, staff must receive additional information of situation from other means (e.g. nurse station annunciator, coded voice message, etc.)
+ Strobes should not be provided in any patient room
+ Operating rooms?



Case Studies

- Objective of private mode is clear:
  - Alert staff
  - Do not alert patients
- Straightforward in some areas:
  - Staff break rooms
  - Patient sleeping rooms
- Several areas within a hospital create unique design challenges:
  - Corridors serving patient rooms
  - Waiting areas for visitors

Corridors

Corridors dedicated to staff and BOH areas only:

+ Audible and visual notification appliances should be provided

Corridors serving patient sleeping/treatment rooms:

+ Must consider construction of corridor separation from patient rooms (e.g. curtains vs solid wall)
+ Minimize patient exposure to alarm signal
+ Not allowed in Florida

Waiting Areas

Visitor waiting areas within private mode notification areas require additional consideration:

- Audible and visible notification should be provided in these areas to the extent possible
- Audible notification appliances may not be sufficient to alert occupants of an emergency (e.g. coded voice message)
- Direction from hospital staff will still be required for visitors during an emergency

Key Design Considerations

9.6.3.6.3 Where occupants are incapable of evacuating themselves because of age, physical or mental disabilities, or physical restraint, the private operating mode, as described in *NFPA 72, National Fire Alarm and Signaling Code*, shall be permitted to be used. Only the attendants and other personnel required to evacuate occupants from a zone, area, floor, or building shall be required to be notified. The notification shall include means to readily identify the zone, area, floor, or building in need of evacuation.

- Recommendation:
  - Provide annunciators at nurse's station
- Provide audible and visible notification as necessary to adequately notify personnel required to evacuate occupants

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Fire Drills

Fire Drills

Simple fire drills as practiced in other occupancies may be extremely disturbing, detrimental or frequently impracticable in healthcare occupancies due to the nature of the occupants

- All employees must be periodically instructed and kept informed with respect to their duties under the facility's evacuation and relocation plan
- Fire drills must be conducted quarterly on each shift
- Fire drills must include the transmission of a fire alarm signal and simulation of emergency fire conditions
  - May be conducted without disturbing patients
  - Intended to test efficiency, knowledge and response of institutional personnel

Questions?

Thank You!

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