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CODE CORNER

ABOUT CODE CORNER

CCFS would like to remind you to check with your local "Authority Having Jurisdiction (AHJ)" for questions and opinions concerning your local Fire and Building Codes. The information contained in this article is supplied as a courtesy by the International Code Council (ICC) and is based on the International Fire and Building Codes and their respective commentaries. Your local codes or ordinances may vary.

CHAPTER 4 ... 2012 IFC Emergency Planning and Preparedness Part 1 of 2

About the 2012 Edition ... CCFS will be publishing sections of the 2012 IFC for your review and comparison. Please note that CCFS is not suggesting you adopt this new regulation. Any regulations used in your state/organization should be in accordance with the recommendations set forth by your local Building Regulations Organization and State Fire Marshal's Office.

General Comments

This chapter is an expansion of the provisions found in the legacy fire codes used to develop the code. The overall approach has been to place all similar requirements into general sections. The unique occupancy and use-specific requirements are provided at the end of Chapter 4.

This chapter first provides general scope and requirements for the reporting of emergencies and the prevention of interference with fire department activities in Section 401.

Section 402 defines "Emergency evacuation drill" and "Lockdown." Section 403 provides the authority for jurisdictions to address hazards associated with public assemblages, regardless of the use or occupancy.

Section 404 provides the detailed requirements for fire safety plans and evacuations based on occupancy and lockdown plans where they are in use. The frequency and required documentation related to evacuation

drills are addressed in Section 405. The minimum criteria for the training of occupants for emergency situations are found in Section 406.

Section 407 provides requirements that apply to occupancies that contain hazardous materials; some of the key elements are Hazardous Materials Inventory Statements (HMIS) and Hazardous Materials Management Plans (HMMP).

Finally, the occupancy-specific requirements, such as seating plans for Group A occupancies, are included in Section 408.

Purpose

In addition to the requirements found throughout the building and fire codes, the requirements found in this chapter focus on the actions of the occupants. These additional requirements are warranted based on higher levels of care related to the concentration of people;

physical and mental capabilities of the occupants; lack of familiarity with a building or simply because of the complexity and size of the building. These requirements are intended to improve the effectiveness of other measures required by the code and the International Building Code® (IBC®).

Basically, this chapter addresses the human contribution to life safety in buildings when a fire or other emergency occurs. The requirements for continuous training and scheduled evacuation drills can be as important as the required periodic inspections and maintenance of built-in fire protection features. The level of preparation by the occupants also improves the emergency responders' abilities during an emergency. The IBC focuses on built-in fire protection features, such as automatic sprinkler systems, fire-resistance rated construction and properly designed egress systems. The human element is only indirectly addressed in the IBC, whereas this chapter fully addresses the human element. Traditionally, fire codes address the human element more directly in their role in the long-term maintenance of buildings and systems.

Chapters 3 and 6 through 10 of the code and Chapters 7 through 10 of the IBC set forth provisions for how and when buildings are to be properly equipped and maintained to prevent damage and loss of life in the event of a fire. These requirements are based on two complementary fire safety strategies: managing the fire and managing the occupants. These strategies are discussed in more detail in the commentary for Chapter 1.

Managing Fire

A fire can be either prevented or managed. This chapter of the code focuses on training and preparedness while also emphasizing prevention. In some cases, moving occupants to minimize their exposure to a hazard is difficult or impractical. In these situations, controlling or eliminating the hazard is preferable, especially while it is still manageable. In fact, this is the concept underlying all fire suppression requirements. Successful fire control depends on building occupants recognizing the fire threat, deciding to respond, choosing how to respond and, in the case of choosing fire control, identifying, locating and using the correct method. All of these functions must promptly take place in that order. Failure to perform promptly may preclude alternative strategies; therefore, location and identification of fire

extinguishers and occupant standpipe hose lines are provided so that incipient fire-fighting equipment is readily accessible to occupants. These appliances, however, are often difficult to operate, and regardless of experience, fighting fire is a difficult and dangerous task. This chapter prescribes training requirements that assist occupants who are expected to respond to incipient fires to be adequately prepared and trained.

Managing Occupants

The management of occupants is primarily moving them away from the hazard. Verifying that enough exits have ample capacity, are immediately accessible, adequately arranged, appropriately identified and suitably protected are only the first steps toward achieving functional life safety. Occupants must know not only where exits are, but also when and how to use them. For instance, studies have shown that people have a “learned irrelevance” to emergency exits. Learned irrelevance is a psychological phenomenon that occurs when a person is exposed to a stimulus but usually does not need to respond to it.

Because of this phenomenon, most occupants are likely to exit the way they have entered, whether it is the correct way or not; therefore, beyond designing the building with an adequate number of exits, a method of encouraging the use of the best exits must be developed.

Identifying dangerous conditions, deciding how to act and responding appropriately and promptly are essential. Various factors and situations can make evacuation not only difficult but potentially impractical.

All of these factors involve the interaction between the building; its systems and features; occupants and the fire. The code concentrates on the last two factors while the IBC regulates the first two factors. Planning for life safety requires a response to these factors by defining the life safety strategies that must be implemented as well as the means to achieve them. Life safety factors, such as buildings, fire and people, are important in managing exposed occupants.

This chapter concentrates on planning and practicing the desired actions of building occupants when a fire occurs. The remainder of the code focuses on the behaviors and procedures that must be practiced or observed to prevent or control a fire. The best way to create a safe building environment is through fire prevention. No sys-

tem can ensure complete protection of building occupants. Fires are not the only emergencies necessitating the implementation of life safety strategies; therefore, this chapter describes requirements for preparing and implementing life safety plans and programs in occupancies with special life safety problems.

These include occupancies in which the number of occupants or the arrangement or complexity of the building may make evacuation or removal from hazardous conditions difficult or impractical.

A reality of the 21st century in the wake of terrorist attacks and school and business shootings is a need to establish so-called “lockdown” procedures in order to protect and defend building occupants. While the code does not mandate the implementation of lockdown plans and procedures, it does provide some minimum standards which such plans must meet when they are prepared.

Not all occupants of each building are equally capable of performing tasks essential to their safety. A growing awareness, not only of people with physical disabilities, but also of what constitutes a disability, has focused life safety on everyone. Federal health care policies and funding criteria have spurred the deinstitutionalization of people who were formerly confined to nursing homes and other traditional health care institutions.

This has created a new category of occupancies—board and care homes (institutional, residential care; I-1)—while the number of beds provided in nursing homes and hospitals continues to grow. Similarly, technological advances have promoted the creation of larger and more complex buildings, including high rises, open malls, domed stadiums, mixed-use complexes and convention centers. All of these situations create special life safety problems that physical features alone cannot remedy. Additionally, these situations require not only that adequate physical accommodations be provided but also that building occupants be trained to respond to emergencies in these facilities.

Life Safety

Life safety strategies involve the development of an explicit statement of a desired life safety outcome. This statement, once designed to the capabilities of the building occupants and the physical arrangement of the exits, becomes a life safety strategy. Such approaches stress

defining a specific strategy or strategies for protecting occupants. Protection may include moving them (assisting), causing them to move (directing), defending them in place or a combination of these measures. An effective strategy must consider the number and capabilities of building occupants; the type, location and arrangement of building exits; the fire and its effects on the people and the building and the number, training and capability of staff to direct or perform fire evacuation or incipient fire-fighting duties. Each strategy, combined with effective planning and practice, becomes the means for achieving the desired life safety outcome.

The life safety strategies for a health care facility, a high-rise office building and a multiplex theater could vary considerably based on the specific characteristics of the use. First, while the number of occupants will be significant in each case, the actual number occupying the building may be varied. Similarly, the occupant density and location of people in the building will vary, as well as the physical arrangement of the building, which in the first example that follows may be assumed as primarily horizontal and, in the second, as principally vertical. The most profound difference will be the capabilities of the occupants. In high rises and theaters, building occupants will be expected to perform life safety behaviors themselves while patients in a health care facility may require substantial assistance; however, high-rise and theater occupants will differ from each other in their levels of familiarity with the building design. Furthermore, in a theater, lighting conditions may interfere with the occupants’ ability to discern the path of egress travel. In the first two examples, health care and high rise, removing all occupants from the building in the event of fire is impractical. In a high-rise building, occupants located above a fire are in greater danger than occupants located below the fire, since combustion products naturally rise. In a health care occupancy, the risk to most occupants is compounded by their weakened or disabled condition prior to the fire. In both of these examples, a life safety strategy should first address the needs of those at greatest risk by removing them from harm. Secondly, the life safety strategy should stress separating endangered occupants and their immediate neighbors from danger until the hazard can be controlled or confined. As seen in each example, life safety strategies should also incorporate both partial relocation and defend-in-place concepts. In the health care facility, however, occupants will be moved horizontally to achieve this objective, while in the high-rise buildings, occupants

will be expected to move downward or upward to separate themselves from danger. In the case of a multiplex theater, occupants will usually be directed to the nearest exit; however, its location may not be known to all or some of them. Furthermore, because employees in assembly occupancies must be trained in the proper use of portable fire extinguishers, the life safety strategy should include instruction in using these appliances to minimize occupant exposure to fire effects. The resulting life safety strategies for these occupancies may resemble the following:

Example 1 - Health Care Facility: Upon notice of fire, direct or assist evacuation and relocate occupants from the area of fire origin to an adjacent smoke compartment through horizontal exits. Remove the most critically ill patients and those with special needs to an area providing the most appropriate level of care.

Example 2 - High-rise Building: Direct occupants in the area or floor of fire origin to the nearest exits. Occupants on the fire floor, the floor above and the floor below will relocate sequentially up or down at least two floors. Occupants located two floors above and two floors below the fire floor will be sequentially relocated following movement of fire floor occupants.

Example 3 - Multiplex Theater: Announce exit locations and evacuation instructions prior to each movie. Over voice/alarm systems, direct occupants to nearest exit. Employees in the immediate vicinity of an incipient fire may attempt to control or extinguish it using a portable fire extinguisher after activating the fire alarm system.

Once the appropriate strategy has been defined, a plan can be expanded with little additional effort to form the backbone of a comprehensive life safety protocol. The following statements provide additional instructions for the aforementioned examples:

Example 1 - Health Care Facility: Monitor or reinforce fire barriers so that they provide adequate defense against fire until it is controlled and extinguished. Staff will report progress of the fire and relocation operation to the Private Branch Exchange (PBX) operator through the nurse call station in adjacent smoke compartments.

Example 2 - High-rise Building: Building fire manager will meet fire department personnel at the central control

station located off the main lobby.

Example 3 - Multiplex Theater: Projectionist will stop films so that the alarm and evacuation instructions are heard and followed. Upon activation of the alarm, instructions are heard and followed while the on-duty manager telephones the fire department to confirm that the fire was reported. Ushers will follow occupants out of each auditorium as conditions permit, closing exit doors and preventing reentry. Upon completing assigned duties, all staff will report to the manager located in front of the lobby entrance.

These expanded statements certainly do not constitute a fully developed plan; however, with these elements of the life safety plan defined, details can be added to send the plan from pre-incident preparation through post-incident follow-up.

A well-developed plan should include all or most of the following elements:

- Assignment of roles and responsibilities;
- Description of fire protection systems, including operating instructions, if appropriate;
- Building floor plans and sections;
- Seating diagrams and occupant load;
- Number, location and path of travel to exits;
- Emergency notification lists and procedures;
- Post-incident follow-up procedures, including salvage and insurance information; and
- Plan revision and evaluation procedures.

Once a plan is developed, reviewed and approved, it must be distributed, practiced and periodically revised.

SECTION 401 - GENERAL

401.1 Scope. Reporting of emergencies, coordination with emergency response forces, emergency plans and procedures for managing or responding to emergencies shall comply with the provisions of this section.

Exception: Firms that have *approved* on-premises firefighting organizations and that are in compliance with *approved* procedures for fire reporting.

▫ *This section describes the overall scope of Chapter 4, which notes that all procedures relating to reporting and managing fire and other emergencies be in*

accordance with this chapter. There is one exception that recognizes organizations, such as large industrial sites, that have on-site fire brigades. The fire brigades and the associated reporting procedures must be approved by the fire code official.

401.2 Approval. Where required by this code, fire safety plans, emergency procedures and employee training programs shall be approved by the fire code official.

▫To verify that emergency procedures, training and fire safety plans have taken all essential factors into account, the plans and procedures must be approved by the fire code official.

401.3 Emergency responder notification. Notification of emergency responders shall be in accordance with Sections 401.3.1 through 401.3.3.

▫This section simply states that the notification of emergency forces must comply with Section 401.3 and all of its subsections.

401.3.1 Fire events. In the event an unwanted fire occurs on a property, the owner or occupant shall immediately report such condition to the fire department.

▫This section requires prompt notification of the fire department in the event of a fire emergency. Employees or other occupants are prohibited from delaying in any way the notification of the fire department.

401.3.2 Alarm activations. Upon activation of a fire alarm signal, employees or staff shall immediately notify the fire department.

▫This section specifically requires immediate notification of the fire department or other emergency response groups when an alarm signal is activated in order to bring emergency forces to bear upon emergencies in the shortest amount of time.

401.3.3 Delayed notification. A person shall not, by verbal or written directive, require any delay in the reporting of a fire to the fire department.

▫Emergency plans and procedures must not include a requirement that employees report an alarm to a supervisor or similar person before calling the fire de-

partment. There can be no substitute for immediate notification of emergency forces because a quick response is the key to efficient and effective rescue and fire fighting.

401.4 Required plan implementation. In the event an unwanted fire is detected in a building or a fire alarm activates, the emergency plan shall be implemented.

▫Sections 401.3.1 through 401.3.3 mandate the prompt notification of emergency responders whenever a fire alarm is activated or an actual fire or suspected fire occurs. Since the emergency plan is designed to safely and effectively deal with those circumstances and safeguard the occupants, it must be implemented simultaneously with emergency responder notification as required by this section.

401.5 Making false report. A person shall not give, signal or transmit a false alarm.

▫Chapter 2 of the code defines a false alarm as an intentional activation of an alarm or notification of a fire or other emergency when no emergency exists. This would not include a malfunctioning alarm system. False alarms have the potential for causing confusion or panic among occupants of the affected premises, a situation that could lead to property damage, personal injury or death. False alarms also place fire fighters and other emergency personnel in potential danger during the unnecessary emergency response. This can jeopardize other lives and property in the community by committing emergency forces to a false situation when they might be needed at an actual emergency elsewhere.

401.6 Emergency evacuation drills. The sounding of a fire alarm signal and the carrying out of an emergency evacuation drill in accordance with the provisions of Section 405 shall be allowed.

▫This section specifically allows fire alarm signals to be utilized as part of emergency evacuation drills. Without this provision, Section 401.3.1 would not allow the activation of the alarm signal during an emergency evacuation drill.

401.7 Unplanned evacuation. Evacuations made necessary by the unplanned activation of a fire alarm system

or by any other emergency shall not be substituted for a required evacuation drill.

▫ *This section makes it clear that unplanned evacuations will not be applied toward fulfillment of the number of drills required. Evacuation drills are intended to provide for an assessment of the adequacy of an emergency action plan and the response of the building occupants. Occupants may or may not be forewarned of a pending drill depending on the circumstances. The staff having the responsibility for conducting the drill does prepare for drills and a key aspect is having monitors in place to assess individual and group performance. An unplanned evacuation does not allow for effective monitoring of performance and, therefore, must not be counted as a required drill.*

401.8 Interference with fire department operations.

It shall be unlawful to interfere with, attempt to interfere with, conspire to interfere with, obstruct or restrict the mobility of or block the path of travel of a fire department emergency vehicle in any way, or to interfere with, attempt to interfere with, conspire to interfere with, obstruct or hamper any fire department operation.

▫ *A potential hazard when fire departments are responding to an emergency is the inability to perform their operations because of physical obstructions, restricted mobility or human interference. This section prohibits any type of interference with emergency response operations. The delay of even a few minutes can cause serious property damage, injuries or fatalities.*

SECTION 402— DEFINITIONS

402.1 Definitions. The following terms are defined in Chapter 2:

EMERGENCY EVACUATION DRILL. LOCKDOWN.

▫ *Definitions of terms can help in the understanding and application of the code requirements. This section directs the code user to Chapter 2 for the proper application of the indicated terms used in this chapter. Terms may be defined in Chapter 2, in*

another International Code® (I-Code®) as indicated in Section 201.3 or the dictionary meaning may be all that is needed (see also commentary, Sections 201 through 201.4).

SECTION 403— PUBLIC ASSEMBLAGES AND EVENTS

403.1 Fire watch personnel. When, in the opinion of the fire code official, it is essential for public safety in a place of assembly or any other place where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest or activity, the owner, agent or lessee shall provide one or more fire watch personnel, as required and approved, to remain on duty during the times such places are open to the public, or when such activity is being conducted.

▫ *Even though Chapter 31 requires standby personnel in tents and membrane structures because of the inherently higher life safety risks associated with such occupancies, this section gives the fire code official the authority to require fire watch personnel in indoor or outdoor Group A occupancies or other venues where people congregate when the nature of the performance, exhibition, display, contest or activity is such that the presence of fire watch personnel are essential to public safety (see commentary, Section 202, definition of “Fire watch”).*

403.1.1 Duties. Fire watch personnel shall keep diligent watch for fires, obstructions to means of egress and other hazards during the time such place is open to the public or such activity is being conducted and take prompt measures for remediation of hazards, extinguishment of fires that occur and assist in the evacuation of the public from the structures.

▫ *Fire watch personnel provide temporary fire safety where there are potential fire and life safety hazards that could affect large numbers of assembled people. A fire watch does not simply watch for a fire but is also present to prevent fire by identifying and controlling fire hazards; monitor and enforce the availability of the means of egress and take initial action to suppress a fire should one occur. A fire watch also provides a method of notifying the fire department if a fire should occur.*

403.2 Public safety plan. In other than Group A or E occupancies, where the fire code official determines that

an indoor or outdoor gathering of persons has an adverse impact on public safety through diminished access to buildings, structures, fire hydrants and fire apparatus access roads or where such gatherings adversely affect public safety services of any kind, the *fire code official* shall have the authority to order the development of, or prescribe a plan for, the provision of an *approved* level of public safety.

▫*This section notes that these provisions are not for Group A and E occupancies, which are dealt with more specifically elsewhere in this chapter. This section is important because it grants the fire code official the authority to require the development of or to prescribe a specific plan for large gatherings. Such gatherings could include outdoor festivals, demonstrations or receptions. If such assemblies include the use of tents and canopies, Chapter 31 would also apply.*

Again, the primary aim of this section is to address the fact that these large gatherings may hamper the ability of the fire department and other emergency responders to access and protect buildings and building occupants.

403.2.1 Contents. The public safety plan, where required by Section 403.2, shall address such items as emergency vehicle ingress and egress, fire protection, emergency egress or escape routes, emergency medical services, public assembly areas and the directing of both attendees and vehicles (including the parking of vehicles), vendor and food concession distribution, and the need for the presence of law enforcement, and fire and emergency medical services personnel at the event.

▫*As further guidance, this section provides some specific issues to be addressed that include items such as: the direction of traffic; vendor and food concession distributors and the need for law enforcement and medical services.*

403.3 Crowd managers. Trained crowd managers shall be provided for facilities or events where more than 1,000 persons congregate. The minimum number of crowd managers shall be established at a ratio of one crowd manager to every 250 persons. Where *approved* by the *fire code official*, the ratio of crowd managers

shall be permitted to be reduced where the facility is equipped throughout with an *approved automatic sprinkler system* or based upon the nature of the event.

▫*This section is similar to the requirement for standby personnel for tents in Section 3104.20. Large assemblies of people create the need for crowd management due to the increased potential for panic and fear among large numbers of people in emergency situations. It is the intent of this section that crowd managers can be personnel already assigned and employed by the facility, provided that they are trained as crowd managers to fulfill this requirement. At the time of an emergency, the trained crowd managers would take on additional responsibilities to control and direct the audience or attendees in a safe manner. Since the fire and life safety profile of a facility is improved where an automatic sprinkler system is installed throughout, the fire code official is authorized by this section to reduce the crowd manager-to-occupant ratio for events on a case-by-case basis (see commentary, Section 3104.20).*

The exact duties and responsibilities of the individuals employed as crowd managers are not defined here other than the requirement that they be trained and present. They could serve as ushers, tour guides, service supervisors for table seating or in some other capacity related to making sure occupants are moved to or from assigned places in an orderly way. The key to the success of this section is that the crowd managers must be trained in crowd management procedures appropriate to the activity being carried on in the facility and they must be present in the required numbers. Training of personnel and the duties assigned to them would have to be approved by the fire code official. See also the commentary to Section 3104.20 for further information on crowd managers.