

## **Non-Fire Hazard Provisions in NFPA Codes and Standards: A Literature Review**

Paul Kashmanian  
Fire Protection Research Foundation  
© November 2013



THE  
FIRE PROTECTION  
RESEARCH FOUNDATION

The Fire Protection Research Foundation  
One Batterymarch Park  
Quincy, Massachusetts, U.S.A. 02169-7471  
E-Mail: [foundation@nfpa.org](mailto:foundation@nfpa.org)  
Web: [www.nfpa.org/foundation](http://www.nfpa.org/foundation)



## **Acknowledgements**

The Fire Protection Research Foundation expresses gratitude to those that assisted with the development and review of the information contained in this report. The Research Foundation appreciates the guidance provide by the Project Technical Panel: Wayne Carson, Norm Groner, and Ron Cote. Special thanks are expressed to the National Fire Protection Association for funding this project.

### **About the Fire Protection Research Foundation**

The [Fire Protection Research Foundation](#) plans, manages, and communicates research on a broad range of fire safety issues in collaboration with scientists and laboratories around the world. The Foundation is an affiliate of NFPA.

### **About the National Fire Protection Association (NFPA)**

NFPA is a worldwide leader in fire, electrical, building, and life safety. The mission of the international nonprofit organization founded in 1896 is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training, and education. NFPA develops more than 300 codes and standards to minimize the possibility and effects of fire and other hazards. All NFPA codes and standards can be viewed at no cost at [www.nfpa.org/freeaccess](http://www.nfpa.org/freeaccess).

**Keywords:** Non-fire, hazard, life safety



## Background

While the scope of NFPA 101, *Life Safety Code*, has typically been focused on building features necessary to minimize danger to life from fire, it also considers non-fire emergencies. Over the last few decades, the NFPA 101 technical committees have considered several proposals that concern the scope of the document relevant to hazards other than fire. However, the extent of non-fire related provisions in NFPA 101 as well as how other NFPA codes and standards address non-fire hazards needs to be better understood. The main objective of this project was to develop a well-organized inventory of the life safety provisions in NFPA 101 and other NFPA codes and standards that related to hazards other than fire.

## Literature Review Process

The inventory was conducted by first identifying the NFPA codes and standards containing information and material related to life safety. The codes and standards included in this technical report are as follows:

- NFPA 72: *National Fire Alarm and Signaling Code (2013 edition)*
- NFPA 90A: *Standard for the Installation of Air-Conditioning and Ventilating Systems (2012 edition)*
- NFPA 90B: *Standard for the Installation of Warm Air Heating and Air-Conditioning Systems (2012 edition)*
- NFPA 92: *Standard for Smoke Control Systems (2012 edition)*
- NFPA 99: *Health Care Facilities Code (2012 edition)*
- NFPA 101: *Life Safety Code (2012 edition)*
- NFPA 102: *Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures (2011 edition)*
- NFPA 130: *Standard for Fixed Guideway Transit and Passenger Rail Systems (2014 edition)*
- NFPA 150: *Standard on Fire and Life Safety in Animal Housing Facilities (2013 edition)*
- NFPA 170: *Standard for Fire Safety and Emergency Symbols (2012 edition)*
- NFPA 415: *Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways (2013 edition)*
- NFPA 424: *Guide for Airport/Community Emergency Planning (2013 edition)*
- NFPA 502: *Standard for Road Tunnels, Bridges, and Other Limited Access Highways (2014 edition)*
- NFPA 520: *Standard on Subterranean Spaces (2010 edition)*
- NFPA 610: *Guide for Emergency and Safety Operations at Motorsports Venues (2009 edition)*
- NFPA 909: *Code for the Protection of Cultural Resource Properties (2013 edition)*

- NFPA 1600: *Standard on Disaster/Emergency Management and Business Continuity Programs (2010 edition)*
- NFPA 1620: *Standard for Pre-Incident Planning (2010 edition)*

The focus of the project was on documents that focus on fire safety. NFPA 5000, *Building Construction and Safety Code*, was excluded from this study because it has a much broader scope than fire safety such as structural safety, which is beyond the scope of this project. Additionally, most of the life safety hazards within the provisions of NFPA 5000 are identical to those in NFPA 101. Therefore including these provisions would create redundancy issues for this technical report and inventory of non-fire hazard provisions.

Once these were identified, the next step was to examine each Code and Standard and tag each provision that applied to life safety beyond fire events. For example, such provisions included topics relative to biological hazards, storms, disaster/emergency management systems, crowd movement, and means of egress. It should be noted that the means of egress provisions generally do apply to the safe evacuation of occupants caused by other hazards. However, those general means of egress provisions that also may apply to egress from fire emergencies were not included.

Each Code and Standard is listed in numerical order. The code texts for the non-fire hazard provisions relating to life safety are noted and any related Annex notes are also included.

## **Summary of Results**

The life safety provisions can be placed in three distinct categories: fire, non-fire, and both (fire and non-fire). A vast majority of the noted provisions can be placed in the “both” category. The majority of non-fire hazard provisions found during this project were in NFPA 101, *Life Safety Code*. In addition, several were located in NFPA 1600, *Standard on Disaster/Emergency Management and Business Continuity Programs*. The table below provides a quick overview of the numbers of requirements noted listed by NFPA code and standard.

Table 1: Inventory count for Non-Fire Hazard Provisions

<b>NFPA Code/Standard</b>	<b># of Non-Fire Hazard Provisions Found</b>
72	4
90A	0
90B	0
92	0
99	1
101	123
102	1
130	14
150	1
170	5
415	0
424	3
502	8
520	0
610	5
909	0
1600	13
1620	7

Altogether, there were 185 non-fire hazard life safety provisions that are documented. Though NFPA 90A, 90B, 92, 415 and 520 did not contain any non-fire hazard provisions of interest, these codes and standards were appropriate to review and the findings of this report can be used in future reports that relate to this particular scope. NFPA 909 states in the earlier sections that it does not relate to life safety and, therefore, contains zero non-fire hazard provisions relating to life safety. The 123 non-fire hazard provisions documented in NFPA 101 are all related to life safety and are either affiliated with means of egress, new buildings, old buildings, crowd movement, situation awareness, emergency planning, carbon monoxide and other non-fire hazards.

<b>NFPA 72: National Fire Alarm and Signaling Code (2013 Edition)</b>		
<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
<p><b>Chapter 24: Emergency Communications Systems (ECS)</b></p> <p>24.2.1</p>	<p><b>24.2 Purpose.</b>  <b>24.2.1</b> The systems covered under Chapter 24 are for the protection of life by indicating the existence of an emergency situation and communicating information necessary to facilitate an appropriate response and action.</p>	
24.2.3	<p><b>24.2.3</b> An emergency communications system is intended to communicate information about emergencies including, but not limited to, fire, human-caused events (accidental and intentional), other dangerous situations, accidents, and natural disasters.</p>	
24.4.2.8	<p><b>24.4.2.8* Relocation and Partial Evacuation.</b> The requirements of 24.4.2.8 shall apply only to systems used for relocation or partial evacuation during a fire condition.</p>	<p><b>A.24.4.2.8</b> When a fire or other emergency occurs in a building, the usual goal is to evacuate the occupants or relocate them so that they are not exposed to hazardous conditions. The exception occurs in occupancies using stay-in-place/defend-in-place (SIP/DIP)[1] strategies. It might also be necessary to alert and provide information to trained staff responsible for assisting evacuation or relocation. Figure A.24.4.2.8 shows several key steps in a person’s reaction and decision making process [2]. Occupants rarely panic in fire situations [3,4]. The behavior that they adopt is based on the information they have, the perceived threat, and the decisions they make. The entire decision path is full of thought and decisions on the part of the occupant, all of which take time before leading to the development of adaptive behavior. In hindsight, the actions of many occupants in real fires are sometimes less than optimal. However, their decisions might have been the best choices given the information they had. Fire alarm systems that only use audible tones and/or flashing strobe lights impart only one bit of information: fire alarm. It has long been recognized that environments having complex egress situations or high hazard potentials require occupant notification systems that provide more than one bit of information [5]. To reduce the response time of the occupants and to effect the desired behavior, the message should contain several key elements [3,6]. The key elements include the following:</p> <ol style="list-style-type: none"> <li>(1) Tell occupants what has happened and where</li> <li>(2) Tell occupants what they should do</li> <li>(3) Tell occupants why they should do it</li> </ol>

**NFPA 72: National Fire Alarm and Signaling Code (2013 Edition)**

Section #	Section Text	Annex Text
		<p>There does not seem to be any research that has tested actual message content to determine the best way to inform occupants. The problem is that each building and each fire is unique. Messaging is further complicated by the need to give different information to different people, depending on their location relative to the fire, their training, and their physical/mental capabilities. Messages should use positive language and avoid negative instructions that could be misinterpreted due to unintelligible communications. For example, if you want people to leave an area, say so: “A fire has been reported in the area. For your safety, use the stairs to evacuate the area immediately.” A bad example is: “The signal tone you have just heard indicated a report of an emergency. If your floor evacuation signal sounds after this message, do not use the elevator, walk to the nearest stairway and leave the floor. While the report is being verified, occupants on other floors should await further instructions.” This message is too long, ambiguous, and subject to misunderstanding if not heard clearly. The word “not” might not be heard clearly, or it might be heard to apply to the entire remaining sentence. Similarly, care should be used in selecting and clearly enunciating words such as “fifth” and “sixth,” which can sound the same if the system and environment lead to low intelligibility. See A.24.4.1.1 for more information on methodology for improved message content, structure, and intelligibility. Refer to Annex D for more information on speech intelligibility and how it is predicted. Content of the message should be predicated on the building fire safety plan, the nature of the building and its occupants, the design of the fire alarm system, and testing of the occupant reaction to the message. Caution is advised that the fire alarm system operation and message actuation might be initiated by a manual pull station or detector remote from the fire.</p> <p>[1] Schifiliti, R. P., “To Leave or Not to Leave—That is the Question!”, National Fire Protection Association, World Fire Safety Congress &amp; Exposition, May 16, 2000, Denver, CO.</p> <p>[2] Ramachandran, G., “Informative Fire Warning Systems,” <i>Fire Technology</i>, vol. 47, no. 1, February 1991, National Fire Protection Association, 66–81.</p> <p>[3] J., Bryan, “Psychological Variables That May Affect Fire Alarm Design,” <i>Fire Protection Engineering</i>, Society of Fire Protection Engineers, Issue No. 11, Fall 2001.</p> <p>[4] Proulx, G., “Cool Under Fire,” <i>Fire Protection Engineering</i>, Society of Fire Protection Engineers, Issue No. 16, Fall 2002.</p> <p>[5] General Services Administration, Proceedings of the Reconvened International Conference on Fire Safety in High Rise Buildings, Washington, D.C., October 1971.</p>

<b>NFPA 72: National Fire Alarm and Signaling Code (2013 Edition)</b>		
<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
		[6] Proulx, G., "Strategies for Ensuring Appropriate Occupant Response to Fire Alarm Signals," National Research Council of Canada, Ottawa, Ontario, <i>Construction Technology Update</i> , No. 43, 1-6, December 2000.
24.4.2.8.5.7	<b>24.4.2.8.5.7</b> Paragraphs 24.4.2.8 through 24.4.2.8.5.6 shall not automatically apply when relocation or partial evacuation is of a non-fire emergency unless identified and required by a risk analysis.	

**NFPA 90A: Standard for the Installation of Air-Conditioning and Ventilating Systems (2012 Edition)**

<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
none		

**NFPA 90B: Standard for the Installation of Warm Air Heating and Air-Conditioning Systems (2012 Edition)**

<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
none		

<b>NFPA 92: Standard for Smoke Control Systems (2012 Edition)</b>		
<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
none		

<b>NFPA 99: Health Care Facilities Code (2012 Edition)</b>		
<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
<p><b>Chapter 5: Gas and Vacuum Systems</b></p> <p>5.1.3.3.1.5</p>	<p><b>5.1 Category 1 Piped Gas and Vacuum Systems.</b></p> <p><b>5.1.3.3.1.5</b> Locations shall be chosen to allow access by delivery vehicles and management of cylinders (e.g., proximity to loading docks, access to elevators, and passage of cylinders through public areas).</p> <p><b>Note:</b> Chapter 5 discusses Gas and Vacuum Systems. More specifically, this section relates to Central Supply System Locations and the cylinders are those that contain gas-filled, volatile liquids or some medical gas.</p>	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
<p><b>Chapter 4: General</b></p> <p>4.1</p>	<p><b>4.1* Goals.</b></p>	<p><b>A.4.1</b> The goals in Section 4.1 reflect the scope of this <i>Code</i> (see <i>Section 1.1</i>). Other fire safety goals that are outside the scope of this <i>Code</i> might also need to be considered, such as property protection and continuity of operations. Compliance with this <i>Code</i> can assist in meeting goals outside the scope of the <i>Code</i>.</p>
<p>4.1.2</p>	<p><b>4.1.2* Comparable Emergencies.</b> An additional goal is to provide life safety during emergencies that can be mitigated using methods comparable to those used in case of fire.</p>	<p><b>A.4.1.2</b> “Comparable emergencies” refers to incidents where the hazard involves thermal attributes similar to fires or airborne contaminants similar to smoke, such that features mandated by this <i>Code</i> can be expected to mitigate the hazard. Examples of such incidents might be explosions and hazardous material releases. The <i>Code</i> recognizes that features mandated by this <i>Code</i> might be less effective against such hazards than against fires.</p>
<p>4.1.3</p>	<p><b>4.1.3* Crowd Movement.</b> An additional goal is to provide for reasonably safe emergency crowd movement and, where required, reasonably safe nonemergency crowd movement.</p>	<p><b>A.4.1.3</b> An assembly occupancy is an example of an occupancy where the goal of providing for reasonably safe emergency and nonemergency crowd movement has applicability. A detention or correctional occupancy is an example of an occupancy where emergency and nonemergency crowd movement is better addressed by detention and correctional facilities specialists than by this <i>Code</i>.</p>
<p>4.2.3</p>	<p><b>4.2.3 Systems Effectiveness.</b> Systems utilized to achieve the goals of Section 4.1 shall be effective in mitigating the hazard or condition for which they are being used, shall be reliable, shall be maintained to the level at which they were designed to operate, and shall remain operational.</p>	
<p>4.5.1</p>	<p><b>4.5 Fundamental Requirements.</b> <b>4.5.1 Multiple Safeguards.</b> The design of every building or structure intended for human occupancy shall be such that reliance for safety to life does not depend solely on any single safeguard. An additional safeguard(s) shall be provided for life safety in case any single safeguard is ineffective due to inappropriate human actions or system failure.</p>	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
4.5.2	<p><b>4.5.2 Appropriateness of Safeguards.</b>                      Every building or structure shall be provided with means of egress and other fire and life safety safeguards of the kinds, numbers, locations, and capacities appropriate to the individual building or structure, with due regard to the following:</p> <ul style="list-style-type: none"> <li>(1) Character of the occupancy, including fire load</li> <li>(2) Capabilities of the occupants</li> <li>(3) Number of persons exposed</li> <li>(4) Fire protection available</li> <li>(5) Capabilities of response personnel</li> <li>(6) Height and construction type of the building or structure</li> <li>(7) Other factors necessary to provide occupants with a reasonable degree of safety</li> </ul>	
4.5.3.2	<p><b>4.5.3.2 Unobstructed Egress.</b>                      In every occupied building or structure, means of egress from all parts of the building shall be maintained free and unobstructed. Means of egress shall be accessible to the extent necessary to ensure reasonable safety for occupants having impaired mobility.</p>	
4.5.3.3	<p><b>4.5.3.3 Awareness of Egress System.</b>                      Every exit shall be clearly visible, or the route to reach every exit shall be conspicuously indicated. Each means of egress, in its entirety, shall be arranged or marked so that the way to a place of safety is indicated in a clear manner.</p>	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
4.5.5	<p><b>4.5.5* Situation Awareness.</b> Systems used to achieve the goals of Section 4.1 shall be effective in facilitating and enhancing situation awareness, as appropriate, by building management, other occupants and emergency responders of the functionality or state of critical building systems, the conditions that might warrant emergency response, and the appropriate nature and timing of such responses.</p>	<p><b>A.4.5.5</b> Systems encompass facilities or equipment and people. Included are fire/smoke detection, alarm, and communication systems plus the system status panels in emergency command centers; supervisory systems for various especially critical components (e.g., certain valves) of fire protection systems; certain signs; and the availability of trained staff, notably in health care occupancies.</p>
4.5.7	<p><b>4.5.7 System Design/Installation.</b> Any fire protection system, building service equipment, feature of protection, or safeguard provided to achieve the goals of this <i>Code</i> shall be designed, installed, and approved in accordance with applicable NFPA standards.</p>	
4.5.8	<p><b>4.5.8 Maintenance.</b> Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this <i>Code</i>, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be maintained, unless the <i>Code</i> exempts such maintenance.</p>	
4.6.9.1(3)	<p><b>4.6.9.1</b> No new construction or existing building shall be occupied in whole or in part in violation of the provisions of this <i>Code</i>, unless the following conditions exist:</p> <ul style="list-style-type: none"> <li>(1) A plan of correction has been approved.</li> <li>(2) The occupancy classification remains the same.</li> <li>(3) No serious life safety hazard exists as judged by the authority having jurisdiction.</li> </ul>	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
4.6.10.2	<p><b>4.6.10.2*</b> In buildings under construction, adequate escape facilities shall be maintained at all times for the use of construction workers. Escape facilities shall consist of doors, walkways, stairs, ramps, fire escapes, ladders, or other approved means or devices arranged in accordance with the general principles of the <i>Code</i> insofar as they can reasonably be applied to buildings under construction.</p>	<p><b>A.4.6.10.2</b> See also NFPA 241, <i>Standard for Safeguarding Construction, Alteration, and Demolition Operations</i>.</p>
4.8.2.1	<p><b>4.8.2.1*</b> Emergency plans shall include the following:</p> <ol style="list-style-type: none"> <li>(1) Procedures for reporting of emergencies</li> <li>(2) Occupant and staff response to emergencies</li> <li>(3)*Evacuation procedures appropriate to the building, its occupancy, emergencies, and hazards (<i>see Section 4.3</i>)</li> <li>(4) Appropriateness of the use of elevators</li> <li>(5) Design and conduct of fire drills</li> <li>(6) Type and coverage of building fire protection systems</li> <li>(7) Other items required by the authority having jurisdiction</li> </ol>	<p><b>A.4.8.2.1</b> Items to be considered in preparing an emergency plan should include the following:</p> <ol style="list-style-type: none"> <li>(1) Purpose of plan</li> <li>(2) Building description, including certificate of occupancy</li> <li>(3) Appointment, organization, and contact details of designated building staff to carry out the emergency duties</li> <li>(4) Identification of events (man-made and natural) considered life safety hazards impacting the building</li> <li>(5) Responsibilities matrix (role-driven assignments)</li> <li>(6) Policies and procedures for those left behind to operate critical equipment</li> <li>(7) Specific procedures to be used for each type of emergency</li> <li>(8) Requirements and responsibilities for assisting people with disabilities</li> <li>(9) Procedures for accounting for employees</li> <li>(10) Training of building staff, building emergency response teams, and other occupants in their responsibilities</li> <li>(11) Documents, including diagrams, showing the type, location, and operation of the building emergency features, components, and systems</li> <li>(12) Practices for controlling life safety hazards in the building</li> <li>(13) Inspection and maintenance of building facilities that provide for the safety of occupants</li> <li>(14) Conducting fire and evacuation drills</li> <li>(15) Interface between key building management and emergency responders</li> <li>(16) Names or job titles of persons who can be contacted for further information or explanation of duties</li> <li>(17) Post-event (including drill) critique/evaluation, as addressed in 5.14 of <i>NFPA 1600, Standard on Disaster/Emergency Management and Business Continuity Programs</i></li> <li>(18) Means to update the plan, as necessary</li> </ol>

<p>4.8.2.1(3)</p>	<p><b>A.4.8.2.1(3)</b> It is assumed that a majority of buildings will use a total evacuation strategy during a fire. It should be noted that evacuation from a building could occur for reasons other than a fire, but such other reasons are not the primary focus of the <i>Code</i>. As used herein, total evacuation is defined as the process in which all, or substantially all, occupants leave a building or facility in either an unmanaged or managed sequence or order. An alternative to total evacuation is partial evacuation, which can be defined as the process in which a select portion of a building or facility is cleared or emptied of its occupants while occupants in other portions mostly carry on normal activity. In either case, the evacuation process can be ordered or managed in accordance with an established priority in which some or all occupants of a building or facility clear their area and utilize means of egress routes. This is typically done so that the more-endangered occupants are removed before occupants in less-endangered areas. Alternative terms describing this sequencing or ordering of evacuation are <i>staged evacuation</i> and <i>phased evacuation</i>. Table A.4.8.2.1(3) illustrates options for extent of management and extent of evacuation. Some of the options shown might not be appropriate. As noted in Table A.4.8.2.1(3), either total or partial evacuation can include staged (zoned) evacuation or phased evacuation, which is referred to as managed or controlled evacuation. It should also be noted that the evacuation process might not include relocation to the outside of the building but might instead include relocation to an area of refuge or might defend the occupants in place to minimize the need for evacuation. The different methods of evacuation are also used in several contexts throughout the <i>Code</i>. Though most of the methods of evacuation are not specifically defined or do not have established criteria, various sections of the <i>Code</i> promulgate them as alternatives to total evacuation. The following sections discuss these alternatives in more detail:</p> <ul style="list-style-type: none"> <li>(1) Section 4.7—Provides requirements for fire and relocation drills</li> <li>(2) 7.2.12 — Provides requirements for area of refuge</li> <li>(3) 7.2.4 — Provides requirements for horizontal exits</li> <li>(4) 9.6.3.6—Provides the alarm signal requirements for different methods of evacuation</li> <li>(5) 9.6.3.9—Permits automatically transmitted or live voice evacuation or relocation instructions to occupants and requires them in accordance with <i>NFPA 72, National Fire Alarm and Signaling Code</i></li> <li>(6) 14.3.4.2.3 (also Chapter 15)—Describes alternative protection systems in educational occupancies</li> <li>(7) 18.1.1.2/18.1.1.3/Section 18.7 (also Chapter 19)—Provide methods of evacuation for health care occupancies</li> <li>(8) Chapters 22 and 23 — Provide methods of evacuation for detention and correctional occupancies, including the five groups of resident user categories</li> <li>(9) Chapters 32 and 33—Provide method of evacuation for residential board and care occupancies</li> </ul>
-------------------	--

	<p>(10) 32.1.5/33.1.5—For residential board and care occupancies, state that “no means of escape or means of egress shall be considered as complying with the minimum criteria for acceptance, unless emergency evacuation drills are regularly conducted”</p> <p>(11) 40.2.5.1.2 — For industrial occupancies, states that “ancillary facilities in special-purpose industrial occupancies where delayed evacuation is anticipated shall have not less than a 2-hour fire resistance-rated separation from the predominant industrial occupancy and shall have one means of egress that is separated from the predominant industrial occupancy by 2-hour fire resistance- rated construction” The method of evacuation should be accomplished in the context of the physical facilities, the type of activities undertaken, and the provisions for the capabilities of occupants (and staff, if available). Therefore, in addition to meeting the requirements of the <i>Code</i>, or when establishing an equivalency or a performance-based design, the following recommendations and general guidance information should be taken into account when designing, selecting, executing, and maintaining a method of evacuation:</p> <p>(1) When choosing a method of evacuation, the available safe egress time (ASET) must always be greater than the required safe egress time (RSET).</p> <p>(2) The occupants’ characteristics will drive the method of evacuation. For example, occupants might be incapable of evacuating themselves because of age, physical or mental disabilities, physical restraint, or a combination thereof. However, some buildings might be staffed with people who could assist in evacuating. Therefore, the method of evacuation is dependent on the ability of occupants to move as a group, with or without assistance. For more information, see the definitions under the term <i>Evacuation Capability</i> in Chapter 3.</p> <p>(3) An alternative method of evacuation might or might not have a faster evacuation time than a total evacuation. However, the priority of evacuation should be such that the occupants in the most danger are given a higher priority. This prioritization will ensure that occupants more intimate with the fire will have a faster evacuation time.</p> <p>(4) Design, construction, and compartmentation are also variables in choosing a method of evacuation. The design, construction, and compartmentation should limit the development and spread of a fire and smoke and reduce the need for occupant evacuation. The fire should be limited to the room or compartment of fire origin. Therefore, the following factors need to be considered: (a) Overall fire resistance rating of the building  (b) Fire-rated compartmentation provided with the building  (c) Number and arrangement of the means of egress</p> <p>(5) Fire safety systems should be installed that compliment the method of evacuation, and should include consideration of the following:</p>
--	---

		<p>(a) Detection of fire</p> <p>(b) Control of fire development</p> <p>(c) Confinement of the effects of fire</p> <p>(d) Extinguishment of fire</p> <p>(e) Provision of refuge or evacuation facilities, or both</p> <p>(6) One of the most important fire safety systems is the fire alarm and communication system, particularly the notification system. The fire alarm system should be in accordance with <i>NFPA 72, National Fire Alarm and Signaling Code</i>, and should take into account the following:</p> <p>(a) Initial notification of only the occupants in the affected zone(s) (e.g., zone of fire origin and adjacent zones)</p> <p>(b) Provisions to notify occupants in other unaffected zones to allow orderly evacuation of the entire building</p> <p>(c) Need for live voice communication</p> <p>(d) Reliability of the fire alarm and communication system</p> <p>(7) The capabilities of the staff assisting in the evacuation process should be considered in determining the method of evacuation.</p> <p>(8) The ability of the fire department to interact with the evacuation should be analyzed. It is important to determine if the fire department can assist in the evacuation or if fire department operations hinder the evacuation efforts.</p> <p>(9) Evacuation scenarios for hazards that are normally outside of the scope of the <i>Code</i> should be considered to the extent practicable. (<i>See 4.3.1.</i>)</p> <p>(10) Consideration should be given to the desire of the occupants to self-evacuate, especially if the nature of the building or the fire warrants evacuation in the minds of the occupants. Self-evacuation might also be initiated by communication between the occupants themselves through face-to-face contact, mobile phones, and so forth.</p> <p>(11) An investigation period, a delay in the notification of occupants after the first activation of the fire alarm, could help to reduce the number of false alarms and unnecessary evacuations. However, a limit to such a delay should be established before a general alarm is sounded, such as positive alarm sequence, as defined in <i>NFPA 72, National Fire Alarm and Signaling Code</i>.</p> <p>(12) Consideration should be given to the need for an evacuation that might be necessary for a scenario other than a fire (e.g., bomb threat, earthquake).</p> <p>(13) Contingency plans should be established in the event the fire alarm and communication system fail, which might facilitate the need for total evacuation.</p> <p>(14) The means of egress systems should be properly maintained to ensure the dependability of the method of evacuation.</p> <p>(15) Fire prevention policies or procedures, or both, should be implemented that reduce the chance of a fire (e.g., limiting smoking or providing fire-safe trash cans).</p> <p>(16) The method of evacuation should be properly documented, and written forms of communication should</p>
--	--	---

	<p>be provided to all of the occupants, which might include sign postings throughout the building. Consideration should be given to the development of documentation for an operation and maintenance manual or a fire emergency plan, or both.</p> <p>(17) Emergency egress drills should be performed on a regular basis. For more information, see Section 4.7 .</p> <p>(18) The authority having jurisdiction should also be consulted when developing the method of evacuation. Measures should be in place and be employed to sequence or control the order of a total evacuation, so that such evacuations proceed in a reasonably safe, efficient manner. Such measures include special attention to the evacuation capabilities and needs of occupants with disabilities, either permanent or temporary. For comprehensive guidance on facilitating life safety for such populations, go to <a href="http://www.nfpa.org">www.nfpa.org</a>. For specific guidance on stair descent devices, see A.7.2.12.2.3(2). In larger buildings, especially high-rise buildings, it is recommended that all evacuations — whether partial or total — be managed to sequence or control the order in which certain occupants are evacuated from their origin areas and to make use of available means of egress. In high-rise buildings, the exit stairs, at any level, are designed to accommodate the egress flow of only a very small portion of the occupants — from only one or a few stories, and within a relatively short time period—on the order of a few minutes. In case of a fire, only the immediately affected floor(s) should be given priority use of the means of egress serving that floor(s). Other floors should then be given priority use of the means of egress, depending on the anticipated spread of the fire and its combustion products and for the purpose of clearing certain floors to facilitate eventual fire service operations. Typically, this means that the one or two floors above and below a fire floor will have secondary priority immediately after the fire floor. Depending on where combustion products move, for example, upwards through a building with cool-weather stack effect, the next priority floors will be the uppermost occupied floors in the building. Generally, in order to minimize evacuation time for most or all of a relatively tall building to be evacuated, occupants from upper floors should have priority use of exit stairs. For people descending many stories of stairs, this priority will maximize their opportunity to take rest stops without unduly extending their overall time to evacuate a building. Thus, the precedence behavior of evacuees should be that people already in an exit stair should normally not defer to people attempting to enter the exit stair from lower floors, except for those lower floors most directly impacted by a fire or other imminent danger. Notably, this is contrary to the often observed behavior of evacuees in high-rise building evacuations where lower floor precedence behavior occurs. (Similarly, in the most commonly observed behavior of people normally disembarking a passenger airliner, people within the aisle defer to people entering the aisle, so that</p>
--	---

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
		<p>the areas closest to the exit typically clear first.) Changing, and generally managing, the sequence or order in which egress occurs will require effectively informing building occupants and evaluating resulting performance in a program of education, training, and drills. When designing the method of evacuation for a complex building, all forms of egress should be considered. For example, consideration could be given to an elevator evacuation system. An elevator evacuation system involves an elevator design that provides protection from fire effects so that elevators can be used safely for egress. See 7.2.13 and A.7.2.12.2.4 for more information. For further guidance, see the following publications:</p> <p>(1) <i>NFPA Fire Protection Handbook</i>, 19th edition, Section 2, Chapter 2, which provides good methodology for managing exposures and determining the method of evacuation</p> <p>(2) <i>NFPA Fire Protection Handbook</i>, 19th edition, Section 13, which provides further commentary on methods of evacuation for different occupancies</p> <p>(3) <i>SFPE Handbook of Fire Protection Engineering</i>, Section 3, Chapter 13, which provides an overview of some of the research on methods of evacuation</p>
4.8.2.2	<p><b>4.8.2.2</b> Required emergency plans shall be submitted to the authority having jurisdiction for review.</p>	
4.8.2.3	<p><b>4.8.2.3</b> Emergency plans shall be reviewed and updated as required by the authority having jurisdiction.</p>	
<p><b>Chapter 7: Means of Egress</b></p> <p>7.1.10.1</p>	<p><b>7.1 General.</b>  <b>7.1.10 Means of Egress Reliability.</b>  <b>7.1.10.1* General.</b>            Means of egress shall be continuously maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.</p>	<p><b>A.7.1.10.1</b> A proper means of egress allows unobstructed travel at all times. Any type of barrier including, but not limited to, the accumulations of snow and ice in those climates subject to such accumulations is an impediment to free movement in the means of egress. Another example of an obstruction or impediment to full instant use of means of egress is any security device or system that emits any medium that could obscure a means of egress. It is, however, recognized that obstructions occur on a short-duration basis. In these instances, awareness training should be provided to ensure that blockages are kept to a minimum and procedures are established for the control and monitoring of the area affected.</p>

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
7.14.2.1	<p><b>7.14 Elevators for Occupant-Controlled Evacuation Prior to Phase I Emergency Recall Operations.</b></p> <p><b>7.14.2 Occupant Information Features.</b></p> <p><b>7.14.2.1*</b> An emergency plan approved by the authority having jurisdiction shall be implemented, specifically including the procedures for occupant evacuation using the exit stairs and the occupant evacuation elevators.</p>	<p><b>A.7.14.2.1</b> Building occupants have traditionally been taught not to use elevators in fire or similar emergencies. The emergency plan should include more than notification that the elevators can be used for emergency evacuation. The plan should include training to make occupants aware that the elevators will be available only for the period of time prior to elevator recall via smoke detection in the elevator lobby, elevator machine room, or elevator hoistway. Occupants should be prepared to use the exit stairs (which are required to be directly accessible from the elevator lobby by 7.14.8.3) where the elevator has been called out of service.</p>
<p><b>Chapter 9: Building Service and Fire Protection Equipment</b></p> <p>9.6.3.6.2</p>	<p><b>9.6.3 Occupant Notification.</b></p> <p><b>9.6.3.6.2*</b> Where total evacuation of occupants is impractical due to building configuration, only the occupants in the affected zones shall be notified initially. Provisions shall be made to selectively notify occupants in other zones to afford orderly evacuation of the entire building.</p>	<p><b>A.9.6.3.6.2</b> To approve an evacuation plan to selectively notify building occupants, the authority having jurisdiction should consider several building parameters, including building compartmentation, detection and suppression system zones, occupant loads, and the number and arrangement of the means of egress. In high-rise buildings, it is typical to evacuate the fire floor, the floor(s) above, and the floor immediately below. Other areas are then evacuated as the fire develops.</p>
9.6.3.6.3	<p><b>9.6.3.6.3</b> Where occupants are incapable of evacuating themselves because of age, physical or mental disabilities, or physical restraint, the private operating mode, as described in <i>NFPA 72, National Fire Alarm and Signaling Code</i>, 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.</p>	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
9.6.3.9.2	<p><b>9.6.3.9.2*</b> Where permitted by Chapters 11 through 43, automatically transmitted or live voice announcements shall be permitted to be made via a voice communication or public address system that complies with the following:</p> <p>(1) Occupant notification, either live or recorded, shall be initiated at a constantly attended receiving station by personnel trained to respond to an emergency.</p> <p>(2) An approved secondary power supply shall be provided for other than existing, previously approved systems.</p> <p>(3) The system shall be audible above the expected ambient noise level.</p> <p>(4) Emergency announcements shall take precedence over any other use.</p>	<p><b>A.9.6.3.9.2</b> The provisions of 9.6.3.9.2 offer an alternative to the emergency voice alarm and communications system provisions (live voice or recorded voice announcements) of <i>NFPA 72, National Fire Alarm and Signaling Code</i>. Occupancies such as large venue assembly occupancies and mercantile mall buildings are occupancies in which the physical configuration (e.g., large volume spaces), function, and human behavior (including elevated levels of occupant-generated noise) present challenges with respect to effective occupant notification by standard means in accordance with <i>NFPA 72</i>. Because the routine operation of these occupancies demands highly reliant, acoustically capable, and sufficiently audible public address systems, properly trained staff can be relied on to use these public address systems to effect occupant evacuation, relocation, or both.</p> <p>As 9.6.3.9.2 specifically permits an alternative means of notification to that prescribed by <i>NFPA 72</i>, it does not mandate that the secondary power supply and the intelligibility and audibility facets of the public address system comply with <i>NFPA 72</i> or suggest that equivalency with the related provisions of <i>NFPA 72</i> is required. However, it is anticipated that, when approving the secondary power and audibility capabilities of public address systems, authorities having jurisdiction will ensure that these systems are conceptually comparable to the emergency voice alarm and communications system provisions of <i>NFPA 72</i>, such that a reliable and effective occupant notification system is provided.</p>
9.6.3.10.1	<p><b>9.6.3.10.1</b> Audible and visible fire alarm notification appliances shall be used only for fire alarm system or other emergency purposes.</p>	
9.6.3.10.2	<p><b>9.6.3.10.2</b> Emergency voice/alarm communication systems shall be permitted to be used for other purposes, subject to the approval of the authority having jurisdiction, if the fire alarm system takes precedence over all other signals, with the exception of mass notification inputs.</p>	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
9.6.4.1	<p><b>9.6.4 Emergency Forces Notification.</b></p> <p><b>9.6.4.1</b> Where required by another section of this <i>Code</i>, emergency forces notification shall be provided to alert the municipal fire department and fire brigade (if provided) of fire or other emergency.</p>	
9.8	<p><b>9.8 Carbon Monoxide (CO) Detection and Warning Equipment.</b></p> <p>Where required by another section of this <i>Code</i>, carbon monoxide (CO) detection and warning equipment shall be provided in accordance with NFPA 720, <i>Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment</i>.</p>	
<p><b>Chapter 11: Special Structures and High-Rise Buildings</b></p> <p>11.2.3.2</p>	<p><b>11.2.3.2 Protection from Hazards.</b></p> <p>Every open structure, other than those structures with only occasional occupancy, shall have automatic, manual, or other protection that is appropriate to the particular hazard and that is designed to minimize danger to occupants in case of fire or other emergency before they have time to use the means of egress.</p>	
11.3.3.2	<p><b>11.3.3.2 Protection from Hazards.</b></p> <p>Every tower, other than structures with only occasional occupancy, shall have automatic, manual, or other protection that is appropriate to the particular hazard and that is designed to minimize danger to occupants in case of fire or other emergency before they have time to use the means of egress.</p>	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
11.4.3.2	<p><b>11.4.3.2 Protection from Hazards.</b>                      Every water-surrounded structure, other than structures with only occasional occupancy, shall have automatic, manual, or other protection that is appropriate to the particular hazard and that is designed to minimize danger to occupants in case of fire or other emergency before they have time to use the means of egress.</p>	
11.8.7	<p><b>11.8.7 Emergency Plans.</b>                      Emergency plans shall be provided in accordance with 4.8.2.</p> <p><b>Note: 4.8.2 Plan Requirements.</b></p>	
<p><b>Chapter 12:                      New Assembly Occupancies</b></p> <p>12.2.5.4.2</p>	<p><b>12.2.5.4 General Requirements for Access and Egress Routes Within Assembly Areas.</b>  <b>12.2.5.4.2*</b> Access and egress routes shall be maintained so that any individual is able to move without undue hindrance, on personal initiative and at any time, from an occupied position to the exits.</p>	<p><b>A.12.2.5.4.2</b> This requirement and the associated requirement of 12.2.5.4.3 have the effect of prohibiting festival seating, unless it truly is a form of seating, such as lawn seating, where generous spaces are commonly maintained between individuals and small groups so that people can circulate freely at any time. Such lawn seating is characterized by densities of about one person per 15 ft<sup>2</sup> (1.4 m<sup>2</sup>). Both requirements prohibit uncontrolled crowd situations, such as in front of stages at rock music concerts where the number and density of people is uncontrolled by architectural or management features.</p>
12.2.5.4.3	<p><b>12.2.5.4.3*</b> Access and egress routes shall be maintained so that crowd management, security, and emergency medical personnel are able to reach any individual at any time, without undue hindrance.</p>	<p><b>A.12.2.5.4.3</b> This requirement is intended to facilitate rapid emergency access to individuals who are experiencing a medical emergency, especially in the case of cardiopulmonary difficulties, where there is a need for rapid medical attention from trained personnel. The requirement also addresses the need for security and law enforcement personnel to reach individuals whose behavior is endangering themselves and others.</p>

<p>12.4.1.1</p>	<p><b>12.4 Special Provisions.</b>  <b>12.4.1 Life Safety Evaluation.</b>  <b>12.4.1.1*</b> Where a life safety evaluation is required by other provisions of the <i>Code</i>, it shall comply with all of the following:  (1) The life safety evaluation shall be performed by persons acceptable to the authority having jurisdiction.  (2) The life safety evaluation shall include a written assessment of safety measures for conditions listed in 12.4.1.2.  (3) The life safety evaluation shall be approved annually by the authority having jurisdiction and shall be updated for special or unusual conditions.</p>	<p><b>A.12.4.1.1</b> Life safety evaluations are examples of performance based approaches to life safety. In this respect, significant guidance in the form and process of life safety evaluations is provided by Chapter 5, keeping in mind the fire safety emphasis in Chapter 5. Performance criteria, scenarios, evaluation, safety factors, documentation, maintenance, and periodic assessment (including a warrant of fitness) all apply to the broader considerations in a life safety evaluation. A life safety evaluation deals not only with fire but also with storms, collapse, crowd behavior, and other related safety considerations for which a checklist is provided in A.12.4.1.3. Chapter 5 provides guidance, based on fire safety requirements, for establishing a documented case showing that products of combustion in all conceivable fire scenarios will not significantly endanger occupants using means of egress in the facility (e.g., due to fire detection, automatic suppression, smoke control, large-volume space, or management procedures). Moreover, means of egress facilities plus facility management capabilities should be adequate to cope with scenarios where certain egress routes are blocked for some reason. In addition to making realistic assumptions about the capabilities of persons in the facility (e.g., an assembled crowd including many disabled persons or persons unfamiliar with the facility), the life safety evaluation should include a factor of safety of not less than 2.0 in all calculations relating to hazard development time and required egress time (the combination of flow time and other time needed to detect and assess an emergency condition, initiate egress, and move along the egress routes). The factor of safety takes into account the possibility that half of the egress routes might not be used (or be usable) in certain situations. Regarding crowd behavior, the potential hazards created by larger masses of people and greater crowd densities (which can be problematic during ingress, occupancy, and egress) demand that technology be used by designers, managers, and authorities responsible for buildings to compensate for the relaxed egress capacity provisions of Table 12.4.2.3. In very large buildings for assembly use, the hazard of crowd crushes can exceed that of fire or structural failure. Therefore, the building designers, managers, event planners, security personnel, police authorities, and fire authorities, as well as the building construction authorities, should understand the potential problems and solutions, including coordination of their activities. For crowd behavior, this understanding includes factors of space, energy, time, and information, as well as specific crowd management techniques, such as metering. Published guidance on these factors and techniques is found in the <i>SFPE Handbook of Fire Protection Engineering</i>, Section 3, Chapter 13, pp. 3-342–3-366 (Proulx, G., “Movement of People”), and the</p>
-----------------	---	--

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
		<p>publications referenced therein. Table 12.2.3.2 and Table 12.4.2.3 are based on a linear relationship between number of seats and nominal flow time, with not less than 200 seconds (3.3 minutes) for 2000 seats plus 1 second for every additional 50 seats up to 25,000. Beyond 25,000 total seats, the nominal flow time is limited to 660 seconds (11 minutes). Nominal flow time refers to the flow time for the most able group of patrons; some groups less familiar with the premises or less able groups might take longer to pass a point in the egress system. Although three or more digits are noted in the tables, the resulting calculations should be assumed to provide only two significant figures of precision.</p>
12.4.1.2	<p><b>12.4.1.2</b> Life safety evaluations shall include an assessment of all of the following conditions and related appropriate safety measures:</p> <ul style="list-style-type: none"> <li>(1) Nature of the events and the participants and attendees</li> <li>(2) Access and egress movement, including crowd density problems</li> <li>(3) Medical emergencies</li> <li>(4) Fire hazards</li> <li>(5) Permanent and temporary structural systems</li> <li>(6) Severe weather conditions</li> <li>(7) Earthquakes</li> <li>(8) Civil or other disturbances</li> <li>(9) Hazardous materials incidents within and near the facility</li> <li>(10) Relationships among facility management, event participants, emergency response agencies, and others having a role in the events accommodated in the facility</li> </ul>	

<p>12.4.1.3</p>	<p><b>12.4.1.3*</b> Life safety evaluations shall include assessments of both building systems and management features upon which reliance is placed for the safety of facility occupants, and such assessments shall consider scenarios appropriate to the facility.</p>	<p><b>A.12.4.1.3</b> Factors to be considered in a life safety evaluation include the following:</p> <ul style="list-style-type: none"> <li>(1) Nature of the events being accommodated, including the following: <ul style="list-style-type: none"> <li>(a) Ingress, intra-event movement, and egress patterns</li> <li>(b) Ticketing and seating policies/practices</li> <li>(c) Event purpose (e.g., sports contest, religious meeting)</li> <li>(d) Emotional qualities (e.g., competitiveness) of event</li> <li>(e) Time of day when event is held</li> <li>(f) Time duration of single event</li> <li>(g) Time duration of attendees' occupancy of the building</li> </ul> </li> <li>(2) Occupant characteristics and behavior, including the following: <ul style="list-style-type: none"> <li>(a) Homogeneity</li> <li>(b) Cohesiveness</li> <li>(c) Familiarity with building</li> <li>(d) Familiarity with similar events</li> <li>(e) Capability (as influenced by factors such as age, physical abilities)</li> <li>(f) Socioeconomic factors</li> <li>(g) Small minority involved with recreational violence</li> <li>(h) Emotional involvement with the event and other occupants</li> <li>(i) Use of alcohol or drugs</li> <li>(j) Food consumption</li> <li>(k) Washroom utilization</li> </ul> </li> <li>(3) Management, including the following: <ul style="list-style-type: none"> <li>(a) Clear, contractual arrangements for facility operation/use as follows: <ul style="list-style-type: none"> <li>i. Between facility owner and operator</li> <li>ii. Between facility operator and event promoter</li> <li>iii. Between event promoter and performer</li> <li>iv. Between event promoter and attendee</li> <li>v. With police forces</li> <li>vi. With private security services</li> <li>vii. With ushering services</li> </ul> </li> <li>(b) Experience with the building</li> <li>(c) Experience with similar events and attendees</li> <li>(d) Thorough, up-to-date operations manual</li> <li>(e) Training of personnel</li> <li>(f) Supervision of personnel</li> <li>(g) Communications systems and utilization</li> <li>(h) Ratios of management and other personnel to attendees</li> <li>(i) Location/distribution of personnel</li> <li>(j) Central command location</li> <li>(k) Rapport between personnel and attendees</li> <li>(l) Personnel support of attendee goals</li> <li>(m) Respect of attendees for personnel due to the following: <ul style="list-style-type: none"> <li>i. Dress (uniform) standards</li> <li>ii. Age and perceived experience</li> <li>iii. Personnel behavior, including interaction</li> <li>iv. Distinction between crowd management and control</li> <li>v. Management concern for facility quality (e.g., cleanliness)</li> </ul> </li> </ul> </li> </ul>
-----------------	---	--

		<p>vi. Management concern for entire event experience of attendees (i.e., not just during occupancy of the building)</p> <p>(4) Emergency management preparedness, including the following:</p> <ul style="list-style-type: none"> <li>(a) Complete range of emergencies addressed in operations manual</li> <li>(b) Power loss</li> <li>(c) Fire</li> <li>(d) Severe weather</li> <li>(e) Earthquake</li> <li>(f) Crowd incident</li> <li>(g) Terrorism</li> <li>(h) Hazardous materials</li> <li>(i) Transportation accident (e.g., road, rail, air)</li> <li>(j) Communications systems available</li> <li>(k) Personnel and emergency forces ready to respond</li> <li>(l) Attendees clearly informed of situation and proper behavior</li> </ul> <p>(5) Building systems, including the following:</p> <ul style="list-style-type: none"> <li>(a) Structural soundness</li> <li>(b) Normal static loads</li> <li>(c) Abnormal static loads (e.g., crowds, precipitation)</li> <li>(d) Dynamic loads (e.g., crowd sway, impact, explosion, wind, earthquake)</li> <li>(e) Stability of nonstructural components (e.g., lighting)</li> <li>(f) Stability of movable (e.g., telescoping) structures</li> <li>(g) Fire protection</li> <li>(h) Fire prevention (e.g., maintenance, contents, housekeeping)</li> <li>(i) Compartmentation</li> <li>(j) Automatic detection and suppression of fire</li> <li>(k) Smoke control</li> <li>(l) Alarm and communications systems</li> <li>(m) Fire department access routes and response capability</li> <li>(n) Structural integrity</li> <li>(o) Weather protection</li> <li>(p) Wind</li> <li>(q) Precipitation (attendees rush for shelter or hold up egress of others)</li> <li>(r) Lightning protection</li> <li>(s) Circulation systems</li> <li>(t) Flowline or network analysis</li> <li>(u) Waywinding and orientation</li> <li>(v) Merging of paths (e.g., precedence behavior)</li> <li>(w) Decision/branching points</li> <li>(x) Route redundancies</li> <li>(y) Counterflow, crossflow, and queuing situations</li> <li>(z) Control possibilities, including metering</li> <li>(aa) Flow capacity adequacy</li> <li>(bb) System balance</li> <li>(cc) Movement time performance</li> <li>(dd) Flow times</li> <li>(ee) Travel times</li> <li>(ff) Queuing times</li> <li>(gg) Route quality</li> </ul>
--	--	--

	<p>(hh) Walking surfaces (e.g., traction, discontinuities)</p> <p>(ii) Appropriate widths and boundary conditions</p> <p>(jj) Handrails, guardrails, and other rails</p> <p>(kk) Ramp slopes</p> <p>(ll) Step geometries</p> <p>(mm) Perceptual aspects (e.g., orientation, signage, marking, lighting, glare, distractions)</p> <p>(nn) Route choices, especially for vertical travel</p> <p>(oo) Resting/waiting areas</p> <p>(pp) Levels of service (overall crowd movement quality)</p> <p>(qq) Services</p> <p>(rr) Washroom provision and distribution</p> <p>(ss) Concessions</p> <p>(tt) First aid and EMS facilities</p> <p>(uu) General attendee services</p> <p>A scenario-based approach to performance-based fire safety is addressed in Chapter 5. In addition to using such scenarios and, more generally, the attention to performance criteria, evaluation, safety factors, documentation, maintenance, and periodic assessment required when the Chapter 5 option is used, life safety evaluations should consider scenarios based on characteristics important in assembly occupancies. These characteristics include the following:</p> <ol style="list-style-type: none"> <li>(1) Whether there is a local or mass awareness of an incident, event, or condition that might provoke egress</li> <li>(2) Whether the incident, event, or condition stays localized or spreads</li> <li>(3) Whether or not egress is desired by facility occupants</li> <li>(4) Whether there is a localized start to any egress or mass start to egress</li> <li>(5) Whether exits are available or not available</li> </ol> <p>Examples of scenarios and sets of characteristics that might occur in a facility follow. <i>Scenario 1.</i> Characteristics: mass start, egress desired (by management and attendees), exits not available, local awareness. Normal egress at the end of an event occurs just as a severe weather condition induces evacuees at the exterior doors to retard or stop their egress. The backup that occurs in the egress system is not known to most evacuees, who continue to press forward, potentially resulting in a crowd crush. <i>Scenario 2.</i> Characteristics: mass start, egress not desired (by management), exits possibly not available, mass awareness. An earthquake occurs during an event. The attendees are relatively safe in the seating area. The means of egress outside the seating area are relatively unsafe and vulnerable to aftershock damage. Facility management discourages mass egress until the means of egress can be checked and cleared for use. <i>Scenario 3.</i> Characteristics: local start, incident stays local, egress desired (by attendees and management), exits available, mass awareness. <i>Scenario 4.</i> Characteristics: mass start, egress desired (by attendees), incident spreads, exits not available, mass awareness. In an open-air facility unprotected from wind, precipitation, and lightning, sudden severe weather prompts egress to shelter, but not</p>
--	---

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
		<p>from the facility. The means of egress congest and block quickly as people in front stop once they are under shelter, while people behind them continue to press forward, potentially resulting in a crowd crush. These scenarios illustrate some of the broader factors to be taken into account when assessing the capability of both building systems and management features on which reliance is placed in a range of situations, not just fire emergencies. Some scenarios also illustrate the conflicting motivations of management and attendees, based on differing perceptions of danger and differing knowledge of hazards, countermeasures, and capabilities. Mass egress might not be the most appropriate life safety strategy in some scenarios, such as Scenario 2. Table A.12.4.1.3 summarizes the characteristics in the scenarios and provides a framework for developing other characteristics and scenarios that might be important for a particular facility, hazard, occupant type, event, or management.</p>
12.7.6.1	<p><b>12.7.6* Crowd Managers.</b>  <b>12.7.6.1</b> Assembly occupancies shall be provided with a minimum of one trained crowd manager or crowd manager supervisor. Where the occupant load exceeds 250, additional trained crowd managers or crowd manager supervisors shall be provided at a ratio of one crowd manager or crowd manager supervisor for every 250 occupants, unless otherwise permitted by one of the following:            (1) This requirement shall not apply to assembly occupancies used exclusively for religious worship with an occupant load not exceeding 2000.            (2) The ratio of trained crowd managers to occupants shall be permitted to be reduced where, in the opinion of the authority having jurisdiction, the existence of an approved, supervised automatic sprinkler system and the nature of the event warrant.</p>	
12.7.6.2	<p><b>12.7.6.2</b> The crowd manager shall receive approved training in crowd management techniques.</p>	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
12.7.7.1	<p><b>12.7.7* Drills.</b>  <b>12.7.7.1</b> The employees or attendants of assembly occupancies shall be trained and drilled in the duties they are to perform in case of fire, panic, or other emergency to effect orderly exiting.</p>	
12.7.7.3	<p><b>12.7.7.3*</b> In the following assembly occupancies, an audible announcement shall be made, or a projected image shall be shown, prior to the start of each program that notifies occupants of the location of the exits to be used in case of a fire or other emergency:            (1) Theaters            (2) Motion picture theaters            (3) Auditoriums            (4) Other similar assembly occupancies with occupant loads exceeding 300 where there are noncontinuous programs</p>	<p><b>A.12.7.7.3</b> It is not the intent of this provision to require an announcement in bowling alleys, cocktail lounges, restaurants, or places of worship.</p>
12.7.13.1	<p><b>12.7.13 Emergency Plans.</b>  <b>12.7.13.1</b> Emergency plans shall be provided in accordance with Section 4.8.</p>	
12.7.13.2	<p><b>12.7.13.2</b> Where assembly occupancies are located in the high-rise portion of a building, the emergency plan shall include egress procedures, methods, and preferred evacuation routes for each event considered to be a life safety hazard that could impact the building, including the appropriateness of the use of elevators.</p>	

**NFPA 101: Life Safety Code (2012 Edition)**

<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
<b>Chapter 13: Existing Assembly Occupancies</b>  13.1.1.4	<b>13.1.1.4</b> An existing building housing an assembly occupancy established prior to the effective date of this <i>Code</i> shall be permitted to be approved for continued use if it conforms to, or is made to conform to, the provisions of this <i>Code</i> to the extent that, in the opinion of the authority having jurisdiction, reasonable life safety against the hazards of fire, explosion, and panic is provided and maintained.	

<p>13.4.1.1</p>	<p><b>13.4 Special Provisions.</b>  <b>13.4.1 Life Safety Evaluation.</b>  <b>13.4.1.1*</b> Where a life safety evaluation is required by other provisions of the <i>Code</i>, it shall comply with all of the following:  (1) The life safety evaluation shall be performed by persons acceptable to the authority having jurisdiction.  (2) The life safety evaluation shall include a written assessment of safety measures for conditions listed in 13.4.1.2.  (3) The life safety evaluation shall be approved annually by the authority having jurisdiction and shall be updated for special or unusual conditions.</p>	<p><b>A.13.4.1.1</b> Life safety evaluations are examples of performance based approaches to life safety. In this respect, significant guidance in the form and process of life safety evaluations is provided by Chapter 5, keeping in mind the fire safety emphasis in Chapter 5. Performance criteria, scenarios, evaluation, safety factors, documentation, maintenance, and periodic assessment (including a warrant of fitness) all apply to the broader considerations in a life safety evaluation. A life safety evaluation deals not only with fire but also with storms, collapse, crowd behavior, and other related safety considerations for which a checklist is provided in A.13.4.1.3. Chapter 5 provides guidance, based on fire safety requirements, for establishing a documented case showing that products of combustion in all conceivable fire scenarios will not significantly endanger occupants using means of egress in the facility (e.g., due to fire detection, automatic suppression, smoke control, large-volume space, or management procedures). Moreover, means of egress facilities plus facility management capabilities should be adequate to cope with scenarios where certain egress routes are blocked for some reason. In addition to making realistic assumptions about the capabilities of persons in the facility (e.g., an assembled crowd including many disabled persons or persons unfamiliar with the facility), the life safety evaluation should include a factor of safety of not less than 2.0 in all calculations relating to hazard development time and required egress time (the combination of flow time and other time needed to detect and assess an emergency condition, initiate egress, and move along the egress routes). This factor of safety takes into account the possibility that half of the egress routes might not be used (or usable) in certain situations. Regarding crowd behavior, the potential hazards created by larger masses of people and greater crowd densities (which can be problematic during ingress, occupancy, and egress) demand that technology be used by designers, managers, and authorities responsible for buildings to compensate for the relaxed egress capacity provisions of Table 13.4.2.3. In very large buildings for assembly use, the hazard of crowd crushes can exceed that of fire or structural failure. Therefore, the building designers, managers, event planners, security personnel, police authorities, and fire authorities, as well as the building construction authorities, should understand the potential problems and solutions, including coordination of their activities For crowd behavior, this understanding includes factors of space, energy, time, and information, as well as specific crowd management techniques, such as metering. Published guidance on these factors and techniques is found in the <i>SFPE Handbook of Fire Protection Engineering</i>, Section 3, Chapter 13, pp. 3-342–3-366 (Proulx, G., “Movement of People”), and the publications referenced therein. Table 13.2.3.2 and Table 13.4.2.3 are based on a linear relationship between number of seats and nominal flow</p>
-----------------	---	--

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
		<p>time, with not less than 200 seconds (3.3 minutes) for 2000 seats plus 1 second for every additional 50 seats up to 25,000. Beyond 25,000 total seats, the nominal flow time is limited to 660 seconds (11 minutes). Nominal flow time refers to the flow time for the most able group of patrons; some groups less familiar with the premises or less able groups might take longer to pass a point in the egress system. Although three or more digits are noted in the tables, the resulting calculations should be assumed to provide only two significant figures of precision.</p>
13.4.1.2	<p><b>13.4.1.2</b> Life safety evaluations shall include an assessment of all of the following conditions and the related appropriate safety measures:</p> <ul style="list-style-type: none"> <li>(1) Nature of the events and the participants and attendees</li> <li>(2) Access and egress movement, including crowd density problems</li> <li>(3) Medical emergencies</li> <li>(4) Fire hazards</li> <li>(5) Permanent and temporary structural systems</li> <li>(6) Severe weather conditions</li> <li>(7) Earthquakes</li> <li>(8) Civil or other disturbances</li> <li>(9) Hazardous materials incidents within and near the facility</li> <li>(10) Relationships among facility management, event participants, emergency response agencies, and others having a role in the events accommodated in the facility</li> </ul>	

<p>13.4.1.3</p>	<p><b>13.4.1.3*</b> Life safety evaluations shall include assessments of both building systems and management features upon which reliance is placed for the safety of facility occupants, and such assessments shall consider scenarios appropriate to the facility.</p>	<p><b>A.13.4.1.3</b> Factors to be considered in a life safety evaluation might include the following:</p> <ul style="list-style-type: none"> <li>(1) Nature of the events being accommodated, including the following: <ul style="list-style-type: none"> <li>(a) Ingress, intra-event movement, and egress patterns</li> <li>(b) Ticketing and seating policies/practices</li> <li>(c) Event purpose (e.g., sports contest, religious meeting)</li> <li>(d) Emotional qualities (e.g., competitiveness) of event</li> <li>(e) Time of day when event is held</li> <li>(f) Time duration of single event</li> <li>(g) Time duration of attendees' occupancy of the building</li> </ul> </li> <li>(2) Occupant characteristics and behavior, including the following: <ul style="list-style-type: none"> <li>(a) Homogeneity</li> <li>(b) Cohesiveness</li> <li>(c) Familiarity with building</li> <li>(d) Familiarity with similar events</li> <li>(e) Capability (as influenced by factors such as age, physical abilities)</li> <li>(f) Socioeconomic factors</li> <li>(g) Small minority involved with recreational violence</li> <li>(h) Emotional involvement with the event and other occupants</li> <li>(i) Use of alcohol or drugs</li> <li>(j) Food consumption</li> <li>(k) Washroom utilization</li> </ul> </li> <li>(3) Management, including the following: <ul style="list-style-type: none"> <li>(a) Clear, contractual arrangements for facility operation/use as follows: <ul style="list-style-type: none"> <li>i. Between facility owner and operator</li> <li>ii. Between facility operator and event promoter</li> <li>iii. Between event promoter and performer</li> <li>iv. Between event promoter and attendee</li> <li>v. With police forces</li> <li>vi. With private security services</li> <li>vii. With ushering services</li> </ul> </li> <li>(b) Experience with the building</li> <li>(c) Experience with similar events and attendees</li> <li>(d) Thorough, up-to-date operations manual</li> <li>(e) Training of personnel</li> <li>(f) Supervision of personnel</li> <li>(g) Communications systems and utilization</li> <li>(h) Ratios of management and other personnel to attendees</li> <li>(i) Location/distribution of personnel</li> <li>(j) Central command location</li> <li>(k) Rapport between personnel and attendees</li> <li>(l) Personnel support of attendee goals</li> <li>(m) Respect of attendees for personnel due to the following: <ul style="list-style-type: none"> <li>i. Dress (uniform) standards</li> <li>ii. Age and perceived experience</li> <li>iii. Personnel behavior, including interaction</li> <li>iv. Distinction between crowd management and control</li> <li>v. Management concern for facility quality (e.g., cleanliness)</li> </ul> </li> </ul> </li> </ul>
-----------------	---	--

		<p>vi. Management concern for entire event experience of attendees (i.e., not just during occupancy of the building)</p> <p>(4) Emergency management preparedness, including the following:</p> <ul style="list-style-type: none"> <li>(a) Complete range of emergencies addressed in operations manual</li> <li>(b) Power loss</li> <li>(c) Fire</li> <li>(d) Severe weather</li> <li>(e) Earthquake</li> <li>(f) Crowd incident</li> <li>(g) Terrorism</li> <li>(h) Hazardous materials</li> <li>(i) Transportation accident (e.g., road, rail, air)</li> <li>(j) Communications systems available</li> <li>(k) Personnel and emergency forces ready to respond</li> <li>(l) Attendees clearly informed of situation and proper behavior</li> </ul> <p>(5) Building systems, including the following:</p> <ul style="list-style-type: none"> <li>(a) Structural soundness</li> <li>(b) Normal static loads</li> <li>(c) Abnormal static loads (e.g., crowds, precipitation)</li> <li>(d) Dynamic loads (e.g., crowd sway, impact, explosion, wind, earthquake)</li> <li>(e) Stability of nonstructural components (e.g., lighting)</li> <li>(f) Stability of movable (e.g., telescoping) structures</li> <li>(g) Fire protection</li> <li>(h) Fire prevention (e.g., maintenance, contents, housekeeping)</li> <li>(i) Compartmentation</li> <li>(j) Automatic detection and suppression of fire</li> <li>(k) Smoke control</li> <li>(l) Alarm and communications systems</li> <li>(m) Fire department access routes and response capability</li> <li>(n) Structural integrity</li> <li>(o) Weather protection</li> <li>(p) Wind</li> <li>(q) Precipitation (attendees rush for shelter or hold up egress of others)</li> <li>(r) Lightning protection</li> <li>(s) Circulation systems</li> <li>(t) Flowline or network analysis</li> <li>(u) Waywinding and orientation</li> <li>(v) Merging of paths (e.g., precedence behavior)</li> <li>(w) Decision/branching points</li> <li>(x) Route redundancies</li> <li>(y) Counterflow, crossflow, and queuing situations</li> <li>(z) Control possibilities, including metering</li> <li>(aa) Flow capacity adequacy</li> <li>(bb) System balance</li> <li>(cc) Movement time performance</li> <li>(dd) Flow times</li> <li>(ee) Travel times</li> <li>(ff) Queuing times</li> <li>(gg) Route quality</li> </ul>
--	--	--

	<p>(hh) Walking surfaces (e.g., traction, discontinuities)  (ii) Appropriate widths and boundary conditions  (jj) Handrails, guardrails, and other rails  (kk) Ramp slopes  (ll) Step geometries  (mm) Perceptual aspects (e.g., orientation, signage, marking, lighting, glare, distractions)  (nn) Route choices, especially for vertical travel  (oo) Resting/waiting areas  (pp) Levels of service (overall crowd movement quality)  (qq) Services  (rr) Washroom provision and distribution  (ss) Concessions  (tt) First aid and EMS facilities  (uu) General attendee services</p> <p>A scenario-based approach to performance-based fire safety is addressed in Chapter 5. In addition to utilizing such scenarios and, more generally, the attention to performance criteria, evaluation, safety factors, documentation, maintenance, and periodic assessment required when the Chapter 5 option is used, life safety evaluations should consider scenarios based on characteristics important in assembly occupancies. These characteristics include the following:</p> <ol style="list-style-type: none"> <li>(1) Whether there is a local or mass awareness of an incident, event, or condition that might provoke egress</li> <li>(2) Whether the incident, event, or condition stays localized or spreads</li> <li>(3) Whether or not egress is desired by facility occupants</li> <li>(4) Whether there is a localized start to any egress or mass start to egress</li> <li>(5) Whether exits are available or not available</li> </ol> <p>Examples of scenarios and sets of characteristics that might occur in a facility follow. <i>Scenario 1.</i> Characteristics: mass start, egress desired (by management and attendees), exits not available, local awareness. Normal egress at the end of an event occurs just as a severe weather condition induces evacuees at the exterior doors to retard or stop their egress. The backup that occurs in the egress system is not known to most evacuees, who continue to press forward, potentially resulting in a crowd crush. <i>Scenario 2.</i> Characteristics: mass start, egress not desired (by management), exits possibly not available, mass awareness. An earthquake occurs during an event. The attendees are relatively safe in the seating area. The means of egress outside the seating area are relatively unsafe and vulnerable to aftershock damage. Facility management discourages mass egress until the means of egress can be checked and cleared for use. <i>Scenario 3.</i> Characteristics: local start, incident stays local, egress desired (by attendees and management), exits available, mass awareness. A localized civil disturbance (e.g., firearms violence) provokes localized egress, which is seen by attendees, generally, who then decide to leave also. <i>Scenario 4.</i> Characteristics: mass start, egress desired (by attendees), incident spreads, exits not available, mass</p>
--	---

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
		<p>awareness. In an open-air facility unprotected from wind, precipitation, and lightning, sudden severe weather prompts egress to shelter but not from the facility. The means of egress congest and block quickly as people in front stop once they are under shelter, while people behind them continue to press forward, potentially resulting in a crowd crush. These scenarios illustrate some of the broader factors to be taken into account when assessing the capability of both building systems and management features on which reliance is placed in a range of situations, not just fire emergencies. Some scenarios also illustrate the conflicting motivations of management and attendees based on differing perceptions of danger and differing knowledge of hazards, countermeasures, and capabilities. Mass egress might not be the most appropriate life safety strategy in some scenarios, such as Scenario 2. Table A.13.4.1.3 summarizes the characteristics in the scenarios and provides a framework for developing other characteristics and scenarios that might be important for a particular facility, hazard, occupant type, event, or management.</p>
13.7.6.1	<p><b>13.7.6* Crowd Managers.</b>  <b>13.7.6.1</b> Assembly occupancies shall be provided with a minimum of one trained crowd manager or crowd manager supervisor. Where the occupant load exceeds 250, additional trained crowd managers or crowd manager supervisors shall be provided at a ratio of one crowd manager or crowd manager supervisor for every 250 occupants, unless otherwise permitted by one of the following:            (1) This requirement shall not apply to assembly occupancies used exclusively for religious worship with an occupant load not exceeding 2000.            (2) The ratio of trained crowd managers to occupants shall be permitted to be reduced where, in the opinion of the authority having jurisdiction, the existence of an approved, supervised automatic sprinkler system and the nature of the event warrant.</p>	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
13.7.6.2	<b>13.7.6.2</b> The crowd manager shall receive approved training in crowd management techniques.	
13.7.7.1	<b>13.7.7* Drills.</b> <b>13.7.7.1</b> The employees or attendants of assembly occupancies shall be trained and drilled in the duties they are to perform in case of fire, panic, or other emergency to effect orderly exiting.	
13.7.7.3	<b>13.7.7.3*</b> In the following assembly occupancies, an audible announcement shall be made, or a projected image shall be shown, prior to the start of each program that notifies occupants of the location of the exits to be used in case of a fire or other emergency: (1) Theaters (2) Motion picture theaters (3) Auditoriums (4) Other similar assembly occupancies with occupant loads exceeding 300 where there are noncontinuous programs	<b>A.13.7.7.3</b> It is not the intent of this provision to require an announcement in bowling alleys, cocktail lounges, restaurants, or places of worship.
13.7.13.1	<b>13.7.13 Emergency Plans.</b> <b>13.7.13.1</b> Emergency plans shall be provided in accordance with Section 4.8.	
13.7.13.2	<b>13.7.13.2</b> Where assembly occupancies are located in the high-rise portion of a building, the emergency plan shall include egress procedures, methods, and preferred evacuation routes for each event considered to be a life safety hazard that could impact the building, including the appropriateness of the use of elevators.	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
<p><b>Chapter 14:</b>  <b>New</b>  <b>Educational</b>  <b>Occupancies</b></p> <p>14.7.1</p>	<p><b>14.7 Operating Features.</b>  <b>14.7.1 Emergency Plan.</b>                      Emergency plans shall be provided in accordance with Section 4.8.</p>	
<p>14.7.2.1</p>	<p><b>14.7.2 Emergency Egress Drills.</b>  <b>14.7.2.1*</b> Emergency egress drills shall be conducted in accordance with Section 4.7 and the applicable provisions of 14.7.2.3 as otherwise provided in 14.7.2.2.</p>	<p><b>A.14.7.2.1</b> The requirements are, of necessity, general in scope, as it is recognized that they apply to all types of educational occupancies as well as conditions of occupancies, such as truant schools; schools for the mentally handicapped, vision impaired, hearing impaired, and speech impaired; and public schools. It is fully recognized that no one code can meet all the conditions of the various buildings involved, and it will be necessary for site administrators to issue supplements to these requirements, but all supplements should be consistent with these requirements.</p>
<p>14.7.2.2</p>	<p><b>14.7.2.2</b> Approved training programs designed for education and training and for the practice of emergency egress to familiarize occupants with the drill procedure, and to establish conduct of the emergency egress as a matter of routine, shall be permitted to receive credit on a one-for-one basis for not more than four of the emergency egress drills required by 14.7.2.3, provided that a minimum of four emergency egress drills are completed prior to the conduct of the first such training and practice program.</p>	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
14.7.2.3	<p><b>14.7.2.3</b> Emergency egress drills shall be conducted as follows:</p> <p>(1) Not less than one emergency egress drill shall be conducted every month the facility is in session, unless both of the following criteria are met:</p> <p>(a) In climates where the weather is severe, the monthly emergency egress drills shall be permitted to be deferred.</p> <p>(b) The required number of emergency egress drills shall be conducted, and not less than four shall be conducted before the drills are deferred.</p> <p>(2) All occupants of the building shall participate in the drill.</p> <p>(3) One additional emergency egress drill, other than for educational occupancies that are open on a year-round basis, shall be required within the first 30 days of operation.</p>	
14.7.2.4	<p><b>14.7.2.4</b> All emergency drill alarms shall be sounded on the fire alarm system.</p>	
<p><b>Chapter 15: Existing Educational Occupancies</b></p> <p>15.7.1</p>	<p><b>15.7 Operating Features.</b> <b>15.7.1 Emergency Plan.</b> Emergency plans shall be provided in accordance with Section 4.8.</p>	
15.7.2.1	<p><b>15.7.2 Emergency Egress Drills.</b> <b>15.7.2.1*</b> Emergency egress drills shall be conducted in accordance with Section 4.7 and the applicable provisions of 15.7.2.3 as otherwise provided by 15.7.2.2.</p>	<p><b>A.15.7.2.1</b> The requirements are, of necessity, general in scope, as it is recognized that they apply to all types of educational occupancies as well as conditions of occupancies, such as truant schools; schools for the mentally handicapped, vision impaired, hearing impaired, and speech impaired; and public schools. It is fully recognized that no one code can meet all the conditions of the various buildings involved, and it will be necessary for site administrators to issue supplements to these requirements, but all supplements should be consistent with these requirements.</p>

**NFPA 101: Life Safety Code (2012 Edition)**

<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
15.7.2.2	<b>15.7.2.2</b> Approved training programs designed for education and training and for the practice of emergency egress to familiarize occupants with the drill procedure, and to establish conduct of the emergency egress as a matter of routine, shall be permitted to receive credit on a one-for-one basis for not more than four of the emergency egress drills required by 15.7.2.3, provided that a minimum of four emergency egress drills are completed prior to the conduct of the first such training and practice program.	
15.7.2.3	<b>15.7.2.3</b> Emergency egress drills shall be conducted as follows: (1) Not less than one emergency egress drill shall be conducted every month the facility is in session, unless both of the following criteria are met: (a) In climates where the weather is severe, the monthly emergency egress drills shall be permitted to be deferred. (b) The required number of emergency egress drills shall be conducted, and not less than four shall be conducted before the drills are deferred. (2) All occupants of the building shall participate in the drill. (3) One additional emergency egress drill, other than for educational occupancies that are open on a year-round basis, shall be required within the first 30 days of operation.	
15.7.2.4	<b>15.7.2.4</b> All emergency drill alarms shall be sounded on the fire alarm system.	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
<p><b>Chapter 16: New Day-Care Occupancies</b></p> <p>16.6.3.4.5</p>	<p><b>16.6.3.4 Detection, Alarm, and Communications Systems.</b></p> <p><b>16.6.3.4.5</b> Single-station or multiple-station carbon monoxide alarms or detectors shall be provided in accordance with Section 9.8 in day-care homes where client sleeping occurs and one or both of the following conditions exist:</p> <p>(1) Fuel-fired equipment is present.</p> <p>(2) An enclosed parking structure is attached to the day- care home.</p>	

<p>16.7.1</p>	<p><b>16.7 Operating Features.</b>  <b>16.7.1* Emergency Plans.</b>  Emergency plans shall be provided in accordance with Section 4.8.</p>	<p><b>A.16.7.1</b> The requirements are, of necessity, general in scope, because it is recognized that they apply to all types of day-care occupancies as well as conditions of occupancies, such as truant day-care occupancies; occupancies for the mentally handicapped, vision impaired, hearing impaired, and speech impaired; adult day-care; care of infants; and day-care occupancies. It is fully recognized that no one code can meet all the conditions of the various buildings involved, and it will be necessary for site administrators, through the written fire emergency response plan, to issue supplements to these requirements; however, all supplements should be consistent with these requirements. Additionally, it is recommended that fire safety be a part of the educational programs of the occupancy for clients.</p> <p>Fire emergency response plans need to be written and made available to all employees, including temporary or substitute staff, so that all employees know what is expected of them during a fire emergency. The elements needed in the written plan should be identified in coordination with the authority having jurisdiction. The facility fire emergency response plan might be a module of a facility disaster plan that covers other emergencies. The proper safeguarding of clients during a fire emergency requires prompt and effective response by the facility employees in accordance with the fire emergency response plan. Duties covered under the plan should be assigned by position rather than by employee name. Such assignment ensures that, in the absence of an employee, the duties of the position will be performed by a substitute or temporary employee assigned to the position. Temporary or substitute employees should be instructed in advance regarding their duties under the plan for the position to which they are assigned. Written fire emergency response plans should include, but should not be limited to, information for employees regarding methods and devices available for alerting occupants of a fire emergency. Employees should know how the fire department is to be alerted. Even where automatic systems are expected to alert the fire department, the written plan should provide for backup alerting procedures by staff. Other responses of employees to a fire emergency should include the following:</p> <ol style="list-style-type: none"> <li>(1) Removal of clients in immediate danger to areas of safety, as set forth in the plan</li> <li>(2) Methods of using building features to confine the fire and its byproducts to the room or area of origin</li> <li>(3) Control of actions and behaviors of clients during removal or evacuation activities and at predetermined safe assembly areas</li> </ol> <p>The written plan should state clearly the facility policy regarding the actions staff are to take or not take to extinguish a fire. It should also incorporate the emergency egress and relocation drill procedures set forth in 16.7.2. For additional guidance on emergency plans, see <i>NFPA 1600, Standard on Disaster/Emergency Management and Business Continuity Programs</i>. This standard establishes a common set of criteria for disaster</p>
---------------	--	--

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
		management, emergency management, and business continuity programs.
16.7.2.1	<p><b>16.7.2 Emergency Egress and Relocation Drills.</b>  <b>16.7.2.1*</b> Emergency egress and relocation drills shall be conducted in accordance with Section 4.7 and the applicable provisions of 16.7.2.2.</p>	<p><b>A.16.7.2.1</b> The requirements are, of necessity, general in scope, because it is recognized that they apply to all types of day-care occupancies as well as conditions of occupancies, such as truant day-care occupancies; and day-care occupancies for the mentally handicapped, vision impaired, hearing impaired, and speech impaired. It is fully recognized that no one code can meet all the conditions of the various buildings involved, and it will be necessary for site administrators to issue supplements to these requirements, but all supplements should be consistent with these requirements.</p>
16.7.2.2	<p><b>16.7.2.2</b> Emergency egress and relocation drills shall be conducted as follows:  (1) Not less than one emergency egress and relocation drill shall be conducted every month the facility is in session, unless both of the following criteria are met:  (a) In climates where the weather is severe, the monthly emergency egress and relocation drills shall be permitted to be deferred.  (b) The required number of emergency egress and relocation drills shall be conducted, and not less than four shall be conducted before the drills are deferred.  (2) All occupants of the building shall participate in the drill.  (3) One additional emergency egress and relocation drill, other than for day-care occupancies that are open on a year-round basis, shall be required within the first 30 days of operation.</p>	

<p><b>Chapter 17: Existing Day-Care Occupancies</b></p> <p>17.7.1</p>	<p><b>17.7 Operating Features.</b> <b>17.7.1* Emergency Plans.</b> Emergency plans shall be provided in accordance with Section 4.8.</p>	<p><b>A.17.7.1</b> The requirements are, of necessity, general in scope, because it is recognized that they apply to all types of day-care occupancies as well as conditions of occupancies, such as truant day-care occupancies; occupancies for the mentally handicapped, vision impaired, hearing impaired, and speech impaired; adult day-care; care of infants; and day-care occupancies. It is fully recognized that no one code can meet all the conditions of the various buildings involved, and it will be necessary for site administrators, through the written fire emergency response plan, to issue supplements to these requirements; however, all supplements should be consistent with these requirements. Additionally, it is recommended that fire safety be a part of the educational programs of the occupancy for clients.</p> <p>Fire emergency response plans need to be written and made available to all employees, including temporary or substitute staff, so that all employees know what is expected of them during a fire emergency. The elements needed in the written plan should be identified in coordination with the authority having jurisdiction. The facility fire emergency response plan might be a module of a facility disaster plan that covers other emergencies. The proper safeguarding of clients during a fire emergency requires prompt and effective response by the facility employees in accordance with the fire emergency response plan. Duties covered under the plan should be assigned by position rather than by employee name. Such assignment ensures that, in the absence of an employee, the duties of the position will be performed by a substitute or temporary employee assigned to the position. Temporary or substitute employees should be instructed in advance regarding their duties under the plan for the position to which they are assigned. Written fire emergency response plans should include, but should not be limited to, information for employees about methods and devices available for alerting occupants of a fire emergency. Employees should know how the fire department is to be alerted. Even where automatic systems are expected to alert the fire department, the written plan should provide for backup alerting procedures by staff. Other responses of employees to a fire emergency should include the following:</p> <ol style="list-style-type: none"> <li>(1) Removal of clients in immediate danger to areas of safety, as set forth in the plan</li> <li>(2) Methods of using building features to confine the fire and its byproducts to the room or area of origin</li> <li>(3) Control of actions and behaviors of clients during removal or evacuation activities and at predetermined safe assembly areas</li> </ol> <p>The written plan should state clearly the facility policy regarding the actions staff are to take or not take to extinguish a fire. It should also incorporate the emergency egress and relocation drill procedures set forth in 17.7.2. For additional guidance on emergency plans, see <i>NFPA 1600, Standard on Disaster/Emergency Management and</i></p>
---	--	--

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
		<p><i>Business Continuity Programs.</i> This standard establishes a common set of criteria for disaster management, emergency management, and business continuity programs.</p>
17.7.2.1	<p><b>17.7.2 Emergency Egress and Relocation Drills.</b>  <b>17.7.2.1*</b> Emergency egress and relocation drills shall be conducted in accordance with Section 4.7 and the applicable provisions of 17.7.2.2.</p>	<p><b>A.17.7.2.1</b> The requirements are, of necessity, general in scope, because it is recognized that they apply to all types of day-care occupancies as well as conditions of occupancies, such as truant day-care occupancies; and day-care occupancies for the mentally handicapped, vision impaired, hearing impaired, and speech impaired. It is fully recognized that no one code can meet all the conditions of the various buildings involved, and it will be necessary for site administrators to issue supplements to these requirements, but all supplements should be consistent with these requirements.</p>
17.7.2.2	<p><b>17.7.2.2</b> Emergency egress and relocation drills shall be conducted as follows:            (1) Not less than one emergency egress and relocation drill shall be conducted every month the facility is in session, unless both of the following criteria are met:            (a) In climates where the weather is severe, the monthly emergency egress and relocation drills shall be permitted to be deferred.            (b) The required number of emergency egress and relocation drills shall be conducted, and not less than four shall be conducted before the drills are deferred.            (2) All occupants of the building shall participate in the drill.            (3) One additional emergency egress and relocation drill, other than for day-care occupancies that are open on a year-round basis, shall be required within the first 30 days of operation.</p>	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
<p><b>Chapter 18: New Health Care Occupancies</b></p> <p>18.7.3.2</p>	<p><b>18.7.3 Maintenance of Means of Egress.</b>  <b>18.7.3.2</b> Health care occupancies that find it necessary to lock means of egress doors shall, at all times, maintain an adequate staff qualified to release locks and direct occupants from the immediate danger area to a place of safety in case of fire or other emergency.</p>	
<p><b>Chapter 19: Existing Health Care Occupancies</b></p> <p>19.7.3.2</p>	<p><b>19.7.3 Maintenance of Means of Egress.</b>  <b>19.7.3.2</b> Health care occupancies that find it necessary to lock means of egress doors shall, at all times, maintain an adequate staff qualified to release locks and direct occupants from the immediate danger area to a place of safety in case of fire or other emergency.</p>	
<p><b>Chapter 20: New Ambulatory Health Care Occupancies</b></p> <p>20.7.3.2</p>	<p><b>20.7.3 Maintenance of Exits.</b>  <b>20.7.3.2</b> Ambulatory health care occupancies that find it necessary to lock exits shall, at all times, maintain an adequate staff qualified to release locks and direct occupants from the immediate danger area to a place of safety in case of fire or other emergency.</p>	
<p><b>Chapter 21: Existing Ambulatory Health Care Occupancies</b></p> <p>21.7.3.2</p>	<p><b>21.7.3 Maintenance of Exits.</b>  <b>21.7.3.2</b> Ambulatory health care occupancies that find it necessary to lock exits shall, at all times, maintain an adequate staff qualified to release locks and direct occupants from the immediate danger area to a place of safety in case of fire or other emergency.</p>	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
<p><b>Chapter 24: One- and Two- Family Dwellings</b></p> <p>24.3.4.2</p>	<p><b>24.3.4.2 Carbon Monoxide and Carbon Monoxide Detection Systems.</b></p> <p><b>24.3.4.2.1</b> Carbon monoxide alarms or carbon monoxide detectors in accordance with Section 9.8 and 24.3.4.2 shall be provided in new one- and two-family dwellings where either of the following conditions exists:</p> <p>(1) Dwelling units with communicating attached garages, unless otherwise exempted by 24.3.4.2.3</p> <p>(2) Dwelling units containing fuel-burning appliances</p> <p><b>24.3.4.2.2*</b> Where required by 24.3.4.2.1, carbon monoxide alarms or carbon monoxide detectors shall be installed in the following locations:</p> <p>(1) Outside of each separate dwelling unit sleeping area in the immediate vicinity of the sleeping rooms</p> <p>(2) On every occupiable level of a dwelling unit, including basements, and excluding attics and crawl spaces</p> <p><b>24.3.4.2.3</b> Carbon monoxide alarms and carbon monoxide detectors as specified in 24.3.4.2.1(1) shall not be required in the following locations:</p> <p>(1) In garages</p> <p>(2) Within dwelling units with communicating attached garages that are open parking structures as defined by the building code</p> <p>(3) Within dwelling units with communicating attached garages that are mechanically ventilated in accordance with the mechanical code</p>	<p><b>A.24.3.4.2.2</b> The placement requirements of NFPA 720, <i>Standard or the Installation of Carbon Monoxide (CO) Detection and Warning Equipment</i>, are modified specifically for one- and two family dwellings as required by this <i>Code</i> and do not affect other regulations within a jurisdiction.</p>

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
<p><b>Chapter 26: Lodging or Rooming Houses</b></p> <p>26.3.4.6</p>	<p><b>26.3.4.6 Carbon Monoxide Alarms and Carbon Monoxide Detection Systems.</b>  <b>26.3.4.6.1</b> Carbon monoxide alarms or carbon monoxide detectors in accordance with Section 9.8 and 26.3.4.6 shall be provided in new lodging or rooming houses where either of the following conditions exists:</p> <p>(1) Lodging or rooming houses with communicating attached garages, unless otherwise exempted by 26.3.4.6.3</p> <p>(2) Lodging or rooming houses containing fuel-burning appliances</p> <p><b>26.3.4.6.2*</b> Where required by 26.3.4.6.1, carbon monoxide alarms or carbon monoxide detectors shall be installed in the following locations:</p> <p>(1) Outside of each separate sleeping area in the immediate vicinity of the sleeping rooms</p> <p>(2) On every occupiable level, including basements, and excluding attics and crawl spaces</p> <p><b>26.3.4.6.3</b> Carbon monoxide alarms and carbon monoxide detectors as specified in 26.3.4.6.1(1) shall not be required in the following locations:</p> <p>(1) In garages</p> <p>(2) Within lodging or rooming houses with communicating attached garages that are open parking structures as defined by the building code</p> <p>(3) Within lodging or rooming houses with communicating attached garages that are mechanically ventilated in accordance with the mechanical code</p>	<p><b>A.26.3.4.6.2</b> The placement requirements of NFPA 720, <i>Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment</i>, are modified to accommodate lodging or rooming house occupancies that are part of multiple occupancy buildings (e.g., an on-call physicians' sleeping room in a hospital). The placement requirements of NFPA 720 are modified specifically for lodging or rooming houses as required by this <i>Code</i> and do not affect other regulations within a jurisdiction.</p>

<p><b>Chapter 28: New Hotels and Dormitories</b></p> <p>28.3.4.6</p>	<p><b>28.3.4.6 Carbon Monoxide Alarms and Carbon Monoxide Detection Systems.</b></p> <p><b>28.3.4.6.1</b> Carbon monoxide alarms or carbon monoxide detectors in accordance with Section 9.8 and 28.3.4.6 shall be provided in new hotels and dormitories where either of the following conditions exists:</p> <p>(1) Guest rooms or guest suites with communicating attached garages, unless otherwise exempted by 28.3.4.6.3</p> <p>(2) Guest rooms or guest suites containing a permanently installed fuel-burning appliance</p> <p><b>28.3.4.6.2</b> Where required by 28.3.4.6.1, carbon monoxide alarms or carbon monoxide detectors shall be installed in the following locations:</p> <p>(1) Outside of each separate guest room or guest suite sleeping area in the immediate vicinity of the sleeping rooms</p> <p>(2) On every occupiable level of a guest room and guest suite</p> <p><b>28.3.4.6.3</b> Carbon monoxide alarms and carbon monoxide detectors as specified in 28.3.4.6.1(1) shall not be required in the following locations:</p> <p>(1) In garages</p> <p>(2) Within guest rooms or guest suites with communicating attached garages that are open parking structures as defined by the building code</p> <p>(3) Within guest rooms or guest suites with communicating attached garages that are mechanically ventilated in accordance with the mechanical code</p> <p><b>28.3.4.6.4</b> Carbon monoxide alarms or carbon monoxide detectors shall be provided in areas other than guest rooms and guest suites in accordance with Section 9.8, as modified by 28.3.4.6.5.</p>	
--	--	--

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
	<p><b>28.3.4.6.5</b> Carbon monoxide alarms or carbon monoxide detectors shall be installed in accordance with the manufacturer’s published instructions in the locations specified as follows:</p> <p>(1) On the ceilings of rooms containing permanently installed fuel-burning appliances</p> <p>(2) Centrally located within occupiable spaces served by the first supply air register from a permanently installed, fuelburning HVAC system</p> <p>(3) Centrally located within occupiable spaces adjacent to a communicating attached garage</p>	
28.4.1.1	<p><b>28.4 Special Provisions.</b>  <b>28.4.1 High-Rise Buildings.</b>  <b>28.4.1.1</b> High-rise buildings shall comply with Section 11.8.</p>	
28.4.1.2	<p><b>28.4.1.2*</b> Emergency plans in accordance with Section 4.8 shall be provided and shall include all of the following:</p> <p>(1) Egress procedures</p> <p>(2) Methods</p> <p>(3) Preferred evacuation routes for each event, including appropriate use of elevators</p>	<p><b>A.28.4.1.2</b> See 4.8.2.1(4).</p> <p><b>Note: 4.8.2.1*</b> Emergency plans shall include the following:</p> <p>(4) Appropriateness of the use of elevators</p>
28.7.1.1	<p><b>28.7 Operating Features.</b>  <b>28.7.1 Hotel Emergency Organization.</b>  <b>28.7.1.1*</b> Employees of hotels shall be instructed and drilled in the duties they are to perform in the event of fire, panic, or other emergency.</p>	<p><b>A.28.7.1.1</b> Employers are obligated to determine the degree to which employees are to participate in emergency activities. Regulations of the U.S. Department of Labor (OSHA) govern these activities and provide options for employers, from total evacuation to aggressive structural fire fighting by employee brigades. <i>(For additional information, see 29 CFR 1910, Subparts E and L, “OSHA Regulations for Emergency Procedures and Fire Brigades.”)</i></p>
28.7.1.2	<p><b>28.7.1.2*</b> Drills of the emergency organization shall be held at quarterly intervals and shall cover such points as the operation and maintenance of the available first aid fire appliances, the testing of devices to alert guests, and a study of instructions for emergency duties.</p>	<p><b>A.28.7.1.2</b> Emergencies should be assumed to have arisen at various locations in the occupancy in order to train employees in logical procedures.</p>

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
28.7.5	<p><b>28.7.5 Emergency Plans.</b> Emergency plans in accordance with Section 4.8 shall be provided.</p>	
<p><b>Chapter 29: Existing Hotels and Dormitories</b></p> <p>29.4.1.2</p>	<p><b>29.4 Special Provisions.</b> <b>29.4.1 High-Rise Buildings.</b> <b>29.4.1.2*</b> Emergency plans in accordance with Section 4.8 shall be provided and shall include all of the following: (1) Egress procedures (2) Methods (3) Preferred evacuation routes for each event, including appropriate use of elevators</p>	<p><b>A.29.4.1.2</b> See 4.8.2.1(4).  <b>Note: 4.8.2.1*</b> Emergency plans shall include the following: (4) Appropriateness of the use of elevators</p>
29.7.5	<p><b>29.7.5 Emergency Plans.</b> Emergency plans in accordance with Section 4.8 shall be provided.</p>	

<p><b>Chapter 30: New Apartment Buildings</b></p> <p>30.3.4.6</p>	<p><b>30.3.4.6 Carbon Monoxide Alarms and Carbon Monoxide Detection Systems.</b></p> <p><b>30.3.4.6.1</b> Carbon monoxide alarms or carbon monoxide detectors in accordance with Section 9.8 and 30.3.4.6 shall be provided in new apartment buildings where either of the following conditions exists:</p> <ul style="list-style-type: none"> <li>(1) Dwelling units with communicating attached garages, unless otherwise exempted by 30.3.4.6.3</li> <li>(2) Dwelling units containing a permanently installed fuelburning appliance</li> </ul> <p><b>30.3.4.6.2</b> Where required by 30.3.4.6.1, carbon monoxide alarms or carbon monoxide detectors shall be installed in the following locations:</p> <ul style="list-style-type: none"> <li>(1) Outside of each separate dwelling unit sleeping area in the immediate vicinity of the sleeping rooms</li> <li>(2) On every occupiable level of a dwelling unit</li> </ul> <p><b>30.3.4.6.3</b> Carbon monoxide alarms and carbon monoxide detectors as specified in 30.3.4.6.1(1) shall not be required in the following locations:</p> <ul style="list-style-type: none"> <li>(1) In garages</li> <li>(2) Within dwelling units with communicating attached garages that are open parking structures as defined by the building code</li> <li>(3) Within dwelling units with communicating attached garages that are mechanically ventilated in accordance with the mechanical code</li> </ul> <p><b>30.3.4.6.4</b> Carbon monoxide alarms or carbon monoxide detectors shall be provided in areas other than dwelling units in accordance with Section 9.8, as modified by 30.3.4.7.5.</p> <p><b>30.3.4.6.5</b> Carbon monoxide alarms or carbon monoxide detectors shall be installed in accordance with the manufacturer's published</p>	
---	--	--

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
	<p>instructions in the locations specified as follows:</p> <p>(1) On the ceilings of rooms containing permanently installed fuel-burning appliances</p> <p>(2) Centrally located within occupiable spaces served by the first supply air register from a permanently installed, fuelburning HVAC system</p> <p>(3) Centrally located within occupiable spaces adjacent to a communicating attached garage</p>	
30.4.1.2	<p><b>30.4 Special Provisions.</b></p> <p><b>30.4.1 High-Rise Buildings.</b></p> <p><b>30.4.1.2*</b> Emergency plans in accordance with Section 4.8 shall be provided and shall include all of the following:</p> <p>(1) Egress procedures</p> <p>(2) Methods</p> <p>(3) Preferred evacuation routes for each event, including appropriate use of elevators</p>	<p><b>A.30.4.1.2</b> See 4.8.2.1(4).</p> <p><b>Note: 4.8.2.1*</b> Emergency plans shall include the following:</p> <p>(4) Appropriateness of the use of elevators</p>
30.7.1	<p><b>30.7 Operating Features.</b></p> <p><b>30.7.1 Emergency Instructions for Residents of Apartment Buildings.</b></p> <p>Emergency instructions shall be provided annually to each dwelling unit to indicate the location of alarms, egress paths, and actions to be taken, both in response to a fire in the dwelling unit and in response to the sounding of the alarm system.</p>	
<p><b>Chapter 31:</b></p> <p><b>Existing Apartment Buildings</b></p> <p>31.4.1.2</p>	<p><b>31.4 Special Provisions.</b></p> <p><b>31.4.1 High-Rise Buildings.</b></p> <p><b>31.4.1.2*</b> Emergency plans in accordance with Section 4.8 shall be provided and shall include all of the following:</p> <p>(1) Egress procedures</p> <p>(2) Methods</p> <p>(3) Preferred evacuation routes for each event, including appropriate use of elevators</p>	<p><b>A.30.4.1.2</b> See 4.8.2.1(4).</p> <p><b>Note: 4.8.2.1*</b> Emergency plans shall include the following:</p> <p>(4) Appropriateness of the use of elevators</p>

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
<p><b>Chapter 32: New Residential Board and Care Occupancies</b></p> <p>32.7.1.1</p>	<p><b>32.7 Operating Features.</b>  <b>32.7.1 Emergency Plan.</b>  <b>32.7.1.1</b> The administration of every residential board and care facility shall have, in effect and available to all supervisory personnel, written copies of a plan for protecting all persons in the event of fire, for keeping persons in place, for evacuating persons to areas of refuge, and for evacuating persons from the building when necessary.</p>	
<p>32.7.1.2</p>	<p><b>32.7.1.2</b> The emergency plan shall include special staff response, including the fire protection procedures needed to ensure the safety of any resident, and shall be amended or revised whenever any resident with unusual needs is admitted to the home.</p>	
<p>32.7.1.3</p>	<p><b>32.7.1.3</b> All employees shall be periodically instructed and kept informed with respect to their duties and responsibilities under the plan, and such instruction shall be reviewed by the staff not less than every 2 months.</p>	
<p>32.7.1.4</p>	<p><b>32.7.1.4</b> A copy of the plan shall be readily available at all times within the facility.</p>	
<p>32.7.3.1</p>	<p><b>32.7.3 Emergency Egress and Relocation Drills.</b>  <b>32.7.3.1</b> Emergency egress and relocation drills shall be conducted not less than six times per year on a bimonthly basis, with not less than two drills conducted during the night when residents are sleeping, as modified by 32.7.3.5 and 32.7.3.6.</p>	
<p>32.7.3.2</p>	<p><b>32.7.3.2</b> The emergency drills shall be permitted to be announced to the residents in advance.</p>	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
32.7.3.3	<b>32.7.3.3</b> The drills shall involve the actual evacuation of all residents to an assembly point, as specified in the emergency plan, and shall provide residents with experience in egressing through all exits and means of escape required by the <i>Code</i> .	
32.7.3.4	<b>32.7.3.4</b> Exits and means of escape not used in any drill shall not be credited in meeting the requirements of this <i>Code</i> for board and care facilities.	
32.7.3.5	<b>32.7.3.5</b> Actual exiting from windows shall not be required to comply with 32.7.3; opening the window and signaling for help shall be an acceptable alternative.	
32.7.3.6	<b>32.7.3.6</b> Residents who cannot meaningfully assist in their own evacuation or who have special health problems shall not be required to actively participate in the drill. Section 18.7 shall apply in such instances.	
<p><b>Chapter 33: Existing Residential Board and Care Occupancies</b></p> <p>33.7.1.1</p>	<p><b>33.7 Operating Features.</b>  <b>33.7.1 Emergency Plan.</b>  <b>33.7.1.1</b> The administration of every residential board and care facility shall have, in effect and available to all supervisory personnel, written copies of a plan for protecting all persons in the event of fire, for keeping persons in place, for evacuating persons to areas of refuge, and for evacuating persons from the building when necessary.</p>	
33.7.1.2	<b>33.7.1.2</b> The emergency plan shall include special staff response, including the fire protection procedures needed to ensure the safety of any resident, and shall be amended or revised whenever any resident with unusual needs is admitted to the home.	

**NFPA 101: Life Safety Code (2012 Edition)**

<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
33.7.1.3	<b>33.7.1.3</b> All employees shall be periodically instructed and kept informed with respect to their duties and responsibilities under the plan, and such instruction shall be reviewed by the staff not less than every 2 months.	
33.7.1.4	<b>33.7.1.4</b> A copy of the plan shall be readily available at all times within the facility.	
33.7.3.1	<b>33.7.3 Emergency Egress and Relocation Drills.</b> <b>33.7.3.1</b> Emergency egress and relocation drills shall be conducted not less than six times per year on a bimonthly basis, with not less than two drills conducted during the night when residents are sleeping, as modified by 33.7.3.5 and 33.7.3.6.	
33.7.3.2	<b>33.7.3.2</b> The emergency drills shall be permitted to be announced to the residents in advance.	
33.7.3.3	<b>33.7.3.3</b> The drills shall involve the actual evacuation of all residents to an assembly point, as specified in the emergency plan, and shall provide residents with experience in egressing through all exits and means of escape required by this <i>Code</i> .	
33.7.3.4	<b>33.7.3.4</b> Exits and means of escape not used in any drill shall not be credited in meeting the requirements of this <i>Code</i> for board and care facilities.	
33.7.3.5	<b>33.7.3.5</b> Actual exiting from windows shall not be required to comply with 33.7.3; opening the window and signaling for help shall be an acceptable alternative.	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
33.7.3.6	<p><b>33.7.3.6</b> If the board and care facility has an evacuation capability classification of impractical, those residents who cannot meaningfully assist in their own evacuation or who have special health problems shall not be required to actively participate in the drill.</p>	
<p><b>Chapter 36: New Mercantile Occupancies</b></p> <p>36.3.4.3.2</p>	<p><b>36.3.4.3.2 Emergency Forces Notification.</b> Emergency forces notification shall be provided and shall include notifying both of the following:</p> <ul style="list-style-type: none"> <li>(1) Fire department in accordance with 9.6.4</li> <li>(2) Local emergency organization, if provided</li> </ul>	
36.4.4.4.3.3	<p><b>36.4.4.4.3.3 Emergency Forces Notification.</b> Emergency forces notification shall be provided and shall include notifying all of the following:</p> <ul style="list-style-type: none"> <li>(1) Fire department in accordance with 9.6.4</li> <li>(2) Local emergency organization, if provided</li> </ul>	
36.4.5.4.4	<p><b>36.4.5.4.4 Emergency Forces Notification.</b> Emergency forces notification shall be provided and shall include notifying both of the following:</p> <ul style="list-style-type: none"> <li>(1) Fire department in accordance with 9.6.4</li> <li>(2) Local emergency organization, if provided</li> </ul>	
36.4.5.6.1	<p><b>36.4.5.6 Emergency Plan and Employee Training.</b></p> <p><b>36.4.5.6.1</b> There shall be in effect an approved written plan for the emergency egress and relocation of occupants.</p>	
36.4.5.6.2	<p><b>36.4.5.6.2</b> All employees shall be instructed and periodically drilled with respect to their duties under the plan.</p>	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
36.7.1	<p><b>36.7 Operating Features.</b>  <b>36.7.1 Emergency Plans.</b>                      Emergency plans complying with Section 4.8 shall be provided in high-rise buildings.</p>	
36.7.2	<p><b>36.7.2 Drills.</b>                      In every Class A or Class B mercantile occupancy, employees shall be periodically trained in accordance with Section 4.7.</p>	
<p><b>Chapter 37: Existing Mercantile Occupancies</b></p> <p>37.3.4.3.2</p>	<p><b>37.3.4.3.2 Emergency Forces Notification.</b> Emergency forces notification shall be provided and shall include notifying both of the following:                      (1) Fire department in accordance with 9.6.4                      (2) Local emergency organization, if provided</p>	
37.4.4.4.3.3	<p><b>37.4.4.4.3.3 Emergency Forces Notification.</b> Emergency forces notification shall be provided and shall include notifying all of the following:                      (1) Fire department in accordance with 9.6.4                      (2) Local emergency organization, if provided</p>	
37.4.5.4.4	<p><b>37.4.5.4.4 Emergency Forces Notification.</b> Emergency forces notification shall be provided and shall include notifying both of the following:                      (1) Fire department in accordance with 9.6.4                      (2) Local emergency organization, if provided</p>	
37.4.5.6.1	<p><b>37.4.5.6 Emergency Plan and Employee Training.</b>  <b>37.4.5.6.1</b> There shall be in effect an approved written plan for the emergency egress and relocation of occupants.</p>	

**NFPA 101: Life Safety Code (2012 Edition)**

Section #	Section Text	Annex Text
37.4.5.6.2	<b>37.4.5.6.2</b> All employees shall be instructed and periodically drilled with respect to their duties under the plan.	
37.7.1	<b>37.7 Operating Features.</b> <b>37.7.1 Emergency Plans.</b> Emergency plans complying with Section 4.8 shall be provided in high-rise buildings.	
37.7.2	<b>37.7.2 Drills.</b> In every Class A or Class B mercantile occupancy, employees shall be periodically trained in accordance with Section 4.7.	
<p><b>Chapter 38: New Business Occupancies</b></p> <p>38.3.4.4</p>	<b>38.3.4.4 Emergency Forces Notification.</b> Emergency forces notification shall be provided and shall include notifying both of the following: (1) Fire department in accordance with 9.6.4 (2) Local emergency organization, if provided	
38.7.1	<b>38.7 Operating Features.</b> <b>38.7.1 Emergency Plans.</b> Emergency plans complying with Section 4.8 shall be provided in high-rise buildings.	
38.7.2	<b>38.7.2 Drills.</b> In all business occupancy buildings occupied by more than 500 persons, or by more than 100 persons above or below the street level, employees and supervisory personnel shall be periodically instructed in accordance with Section 4.7 and shall hold drills periodically where practicable.	
<p><b>Chapter 39: Existing Business Occupancies</b></p> <p>39.7.1</p>	<b>39.7 Operating Features.</b> <b>39.7.1 Emergency Plans.</b> Emergency plans complying with Section 4.8 shall be provided in high-rise buildings.	

**NFPA 101: Life Safety Code (2012 Edition)**

<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
39.7.2	<b>39.7.2 Drills.</b> In all business occupancy buildings occupied by more than 500 persons, or by more than 100 persons above or below the street level, employees and supervisory personnel shall be periodically instructed in accordance with Section 4.7 and shall hold drills periodically where practicable.	

**NFPA 102: Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures (2011 Edition)**

<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
Chapter 1: Administration  1.2	<b>1.2 Purpose.</b> The purpose of this standard is to provide minimum requirements for life safety in relation to fire, storm, collapse, and crowd behavior in tents, membrane structures, and assembly seating as covered in Section 1.1.	

**NFPA 130: Standard for Fixed Guideway Transit and Passenger Rail Systems (2014 Edition)**

Section #	Section Text	Annex Text
<p><b>Chapter 4: General</b></p> <p>4.2</p>	<p><b>4.2 Goals.</b>  <b>4.2.1*</b> The goals of this standard shall be to provide an environment for occupants of fixed guideway and passenger rail system elements that is safe from fire and similar emergencies to a practical extent based on the following measures:            (1) Protection of occupants not intimate with the initial fire development            (2) Maximizing the survivability of occupants intimate with the initial fire development</p>	<p><b>A.4.2.1</b> The fire-life safety concepts in this standard are predicated and achieved by providing tenable conditions for evacuation of passengers described in this standard, as follows:            (1) Fire hazard control through use of fire-hardened materials in stations, tunnels, and trains            (2) Provision of fire detection, alarm notification, communication systems, and evacuation routes            (3) Natural ventilation or mechanical ventilation providing smoke control to maintain tenability            (4) Fire safety system reliability through system redundancy and increased safety in emergency system wires and cables that might be exposed to fire</p> <p>The inclusion of automatic fire suppression systems in stations, tunnels, or trains provides an active system that can limit fire growth and thereby assist in reducing risk to life and property. Where such systems are provided, variations to requirements in this standard for materials, communications, systems, or reliability can be considered where supported by engineering analysis as permitted by Section 1.4 and in accordance with good fire protection engineering practice.</p>
<p>5.3.1.2</p>	<p><b>5.3.1.2</b> For a station, the design of the means of egress shall be based on an emergency condition requiring evacuation of the train(s) and station occupants to a point of safety.</p>	
<p>5.3.8.6</p>	<p><b>5.3.8.6*</b> Fare barriers shall be designed so that their failure to operate properly will not prohibit movement of passengers in the direction of emergency egress.</p>	<p><b>A.5.3.8.6</b> Refer to A.5.3.8.2.  <b>(A.5.3.8.2</b> “Unimpeded travel in the direction of egress” means that any barriers in the equipment (such as paddles, gates, or turnstiles) either drop away to create a clear opening or swing or revolve freely in the direction of egress with no latching mechanism.)</p>
<p>6.1.2.1</p>	<p><b>6.1.2 Use and Occupancy.</b>  <b>6.1.2.1</b> Passengers shall enter the trainways only in the event that it becomes necessary to evacuate a train.</p>	
<p>6.1.2.2</p>	<p><b>6.1.2.2</b> Evacuation shall take place only under the guidance and control of authorized, trained system employees or other authorized personnel as warranted under an emergency situation.</p>	

**NFPA 130: Standard for Fixed Guideway Transit and Passenger Rail Systems (2014 Edition)**

Section #	Section Text	Annex Text
6.3.1.1	<p><b>6.3 Emergency Egress.</b>  <b>6.3.1 Location of Egress Routes.</b>  <b>6.3.1.1*</b> The system shall incorporate a walk surface or other approved means for passengers to evacuate a train at any point along the trainway so that they can proceed to the nearest station or other point of safety.</p>	<p><b>A.6.3.1.1</b> The trainway and the vehicle means of egress should be designed to be compatible. (<i>See Chapter 8.</i>)</p>
6.3.5.1	<p><b>6.3.5 Signage, Illumination, and Emergency Lighting.</b>  <b>6.3.5.1</b> Warning signs posted on entrances to the trainway and on fences or barriers adjacent to the trainway shall clearly state the hazard (e.g., DANGER HIGH VOLTAGE — 750 VOLTS) with letter sizes and colors in conformance with <i>NFPA 70</i> and Occupational Safety and Health Administration (OSHA) requirements.</p>	
6.4.1.1	<p><b>6.4 Fire Protection and Life Safety Systems.</b>  <b>6.4.1 Emergency Access.</b>  <b>6.4.1.1</b> Except as described herein, points of egress and exits from the guideway shall serve as emergency access routes.</p>	
<p><b>Chapter 8: Vehicles</b></p> <p>8.8.1</p>	<p><b>8.8 Emergency Egress Facilities.</b>  <b>8.8.1*</b> Each vehicle shall be provided with a minimum of two means of emergency egress located on the sides or at the end(s), installed as remotely from each other as practicable.</p>	<p><b>A.8.8.1</b> Since 1980, the Federal Railroad Administration (FRA) has required that each rail passenger car be provided with at least four emergency window exits. In 1999, the FRA issued a passenger equipment rule that required each intercity and commuter rail car to be equipped with a minimum number of two side doors per car and at least four emergency window exits for each main level. Each sleeping compartment must also be provided with an emergency window exit. Because fixed guideway vehicles historically have been provided with at least two sets of bi-leaf side doors, one on each side, emergency exit windows usually are not provided.</p>

**NFPA 130: Standard for Fixed Guideway Transit and Passenger Rail Systems (2014 Edition)**

Section #	Section Text	Annex Text
8.8.1.1	<b>8.8.1.1*</b> Alternative means of emergency egress, including roof hatches as necessary for the type of vehicle, shall be approved.	<b>A.8.8.1.1</b> After a collision or derailment, the vehicle might come to a rest in an orientation other than upright. When designing alternative means of emergency egress, consideration should be given to reaching the emergency egress, regardless of vehicle orientation. This can be accomplished by the utilization of fixed appurtenances in the vehicle, ladders, or ramps.
8.8.2	<b>8.8.2</b> A means to allow passengers to evacuate the vehicle safely to a walk surface or other suitable area under the supervision of authorized employees in case of an emergency shall be provided.	
8.11.6.3	<b>8.11.6 Maintenance of Design Features.</b> <b>8.11.6.3</b> Any variations made to vehicle original design features that affect life safety and fire protection shall be approved prior to the actual change being made.	
<b>Chapter 9: Emergency Procedures</b>  9.2.3	<b>9.2.3</b> Passengers shall be advised and informed during an emergency, to discourage panic or stress during adverse circumstances.	

<p>9.3</p>	<p><b>9.3 Emergencies.</b>  The emergency management plan shall address the following types of emergencies:</p> <ul style="list-style-type: none"> <li>(1) Fire or smoke conditions within the system structures, including stations, guideways (revenue or nonrevenue), and support facilities</li> <li>(2) Collision or derailment involving the following: <ul style="list-style-type: none"> <li>(a) Rail vehicles on the guideway</li> <li>(b) Rail vehicles with privately owned vehicles</li> <li>(c) Intrusion into the right-of-way from adjacent roads or properties</li> </ul> </li> <li>(3) Loss of primary power source resulting in stalled trains, loss of illumination, and availability of emergency power</li> <li>(4) Evacuation of passengers from a train to all right-of-way configurations under circumstances where assistance is required</li> <li>(5) Passenger panic</li> <li>(6) Disabled, stalled, or stopped trains due to adverse personnel/passenger emergency conditions</li> <li>(7) Tunnel flooding from internal or external sources</li> <li>(8) Disruption of service due to disasters or dangerous conditions adjacent to the system, such as hazardous spills on adjacent roads or police activities or pursuits dangerously close to the operational system</li> <li>(9) Structural collapse or imminent collapse of the authority property or adjacent property that threatens safe operations of the system</li> <li>(10) Hazardous materials accidentally or intentionally released into the system</li> <li>(11) Serious vandalism or criminal acts, including terrorism</li> </ul>	
------------	--	--

**NFPA 130: Standard for Fixed Guideway Transit and Passenger Rail Systems (2014 Edition)**

<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
	(12) First aid or medical care for passengers on trains and in stations (13) Extreme weather conditions, such as heavy snows, high or low temperatures, sleet, or ice (14) Earthquake (15) Any other emergency as determined by the authority having jurisdiction	

**NFPA 150: Standard on Fire and Life Safety in Animal Housing Facilities  
(2013 Edition)**

<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
Chapter 4: General Requirements  4.3.4.1	<b>4.3.4 Disaster/Emergency Management Program.</b> <b>4.3.4.1 General.</b> Disaster/emergency management programs shall be required in all animal housing facilities to protect and ensure the safety of the animal and human occupants during fire or other similar emergencies.	

**NFPA 170: Standard for Fire Safety and Emergency Symbols (2012 Edition)**

Section #	Section Text	Annex Text
<b>Chapter 1: Administration</b>  1.1	<b>1.1 Scope.</b> This standard presents symbols used for fire safety, emergency, and associated hazards.	
1.2	<b>1.2 Purpose.</b> The purpose of this standard is to standardize the symbols used in representing fire safety, emergency, and associated hazards.	
<b>Chapter 4: Symbols for General Use</b>  4.1.1	<b>4.1 Introduction.</b> <b>4.1.1</b> This chapter presents general referents and symbols for fire prevention and visual alerting that shall be used for fire and related life safety emergencies.	
<b>Chapter 5: Symbols for Use by the Fire Service</b>  5.1.1	<b>5.1 Introduction.</b> <b>5.1.1*</b> This chapter presents standard referents and symbols that shall be used for visually alerting fire fighters and other emergency responders during fire and related emergencies.	<b>A.5.1.1</b> The purpose of this chapter is to present uniform fire-fighting symbols in order to improve communication wherever symbology is employed in order to provide information to fire fighters and other emergency responders. This chapter provides uniformity in the selection of symbols that are intended to assist fire fighters in locating utilities and fire-fighting equipment.
<b>Chapter 9: Symbols for Use in Pre-Incident Planning Sketches</b>  9.6	<b>9.6* Identification of Hazardous Materials.</b> NFPA 704, <i>Standard System for the Identification of the Hazards of Materials for Emergency Response</i> , shall be permitted to be used to identify the location of hazardous materials within a structure.	<b>A.9.6</b> Figure A.9.6 shows an example of hazardous identification.  <b>FIGURE A.9.6 Example of Hazardous Identification.</b>

<b>NFPA 415: Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways (2013 Edition)</b>		
<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
none		

**NFPA 424: Guide for Airport/Community Emergency Planning (2013 Edition)**

Section #	Section Text	Annex Text
<p><b>Chapter 4: Elements of Emergency Planning</b></p> <p>4.2.1</p>	<p><b>4.2 Types of Emergencies and Emergency Alerts.</b> <i>(See Annex D.)</i></p> <p><b>4.2.1</b> Many different types of emergencies can strike a community. However, when creating the AEP, the focus should be on aircraft-related incidents. Preparation, including risk assessment for other types of emergencies, should be addressed in the pre-emergency planning documents built around the special nature of those incidents.</p>	
<p><b>Chapter 5: Agencies Involved</b></p> <p>5.3.5</p>	<p><b>5.3 ARFF Services (Departments).</b></p> <p><b>5.3.5</b> As part of the interagency planning process, health and safety risks associated with an aircraft accident/incident should be communicated to other agencies that could become involved. The IC of the ARFF response should ensure that other agencies working within the immediate crash site are aware of the potential hazards and the appropriate personnel protective clothing/equipment that could be required.</p>	
<p>5.4.2</p>	<p><b>5.4 Police/Security Services.</b></p> <p><b>5.4.2*</b> Congestion-free ingress and egress roads should be established immediately for emergency vehicles. The security services, police force, or other appropriate local authorities should be expected to ensure that only persons with specific tasks are allowed at the scene of the accident, and they also should be expected to route the normal traffic away from or around the accident site.</p>	<p><b>A.5.4.2</b> The first security officer to arrive should assume security responsibility, survey the scene, and request reinforcements as needed. This security officer should remain in command until relieved by the appropriate security authority with jurisdiction over the area. The security chief should be highly visible. Typically, a blue industrial hard hat with reflective lettering displayed fore and aft and imprinted with “SECURITY CHIEF” should be issued to the security incident commander. Security personnel and police will be needed to handle traffic, to keep unauthorized personnel from the crash site, and to assume custody of personal effects removed from the aircraft. Ingress and egress roads should be established as congestion-free traffic lanes for emergency vehicles. Normal traffic should be routed away from and around the crash site.</p> <p>The emergency site should be cordoned off as soon as possible to exclude intruders, sightseers, onlookers, and souvenir hunters. Appropriate markings should be prominently displayed to advise all persons of possible hazards that can cause serious injury should they encroach</p>

**NFPA 424: Guide for Airport/Community Emergency Planning (2013 Edition)**

<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
		<p>on the area. Armbands, site passes, or ID tags should be issued by the controlling authority and monitored by the security coordinator and his or her team. A mutual aid program should be instituted between all potentially involved security agencies, for example, airport, city, county, state, and federal security forces; mail inspectors; and, where appropriate, military police and customs officials.</p> <p>Special security provisions are necessary to protect any mail involved and any dangerous goods that can be present, and to protect against radioactive materials exposure.</p>

**NFPA 502: Standard for Road Tunnels, Bridges, and Other Limited Access Highways (2014 Edition)**

Section #	Section Text	Annex Text
<p><b>Chapter 4: General Requirements</b></p> <p>4.3.2</p>	<p><b>4.3.2* Fire Protection, Life Safety, and Emergency Systems Reliability.</b> Regardless of the length or type of facility, the intended function of the fire protection, life safety, or emergency systems that address an emergency shall not be subject to failure as a result of the emergency that those systems are designed to address when working in combination.</p>	<p><b>A.4.3.2</b> Fire protection, life safety, or emergency systems are comprised of interdependent mechanical, electrical, communications, control, fire protection, structural, architectural, and other elements, all of which must function as a system to achieve the designed result. It is critical that all primary and supporting elements are protected to produce a similar level of combined system reliability for the design incident exposure. This does not preclude loss of elements that are compensated for in the design.</p>
<p>4.7</p>	<p><b>4.7* Commissioning and Integrated Testing.</b></p>	<p><b>A.4.7</b> The commissioning and integrated testing plans should be prepared in accordance with NFPA 3.</p>
<p>4.7.1</p>	<p><b>4.7.1</b> The agency shall require the development of a commissioning plan to facilitate the verification of the operational readiness of all installed fire protection, life safety, and emergency systems required by this standard, other applicable NFPA standards, and as required within the basis of design (BOD) for construction.</p>	
<p>4.7.3</p>	<p><b>4.7.3</b> The commissioning plan shall document the procedures to be used for the testing of the specific individual fire protection, life safety, and emergency systems, including procedures and requirements to verify operational readiness of integrated and/or interconnected fire protection, life safety, and emergency systems.</p>	

**NFPA 502: Standard for Road Tunnels, Bridges, and Other Limited Access Highways (2014 Edition)**

Section #	Section Text	Annex Text
<p><b>Chapter 13: Emergency Response</b></p> <p>13.2</p>	<p><b>13.2* Emergencies.</b> The following typical incidents shall be considered during the development of facility emergency response plans:</p> <ul style="list-style-type: none"> <li>(1) Fire or a smoke condition in one or more vehicles or in the facility</li> <li>(2) Fire or a smoke condition adjoining or adjacent to the facility</li> <li>(3) Collision involving one or more vehicles</li> <li>(4) Loss of electric power that results in loss of illumination, ventilation, or other life safety systems</li> <li>(5) Rescue and evacuation of motorists under adverse conditions</li> <li>(6) Disabled vehicles</li> <li>(7) Flooding of a travel way or an evacuation route</li> <li>(8) Seepage and spillage of flammable, toxic, or irritating vapors and gases</li> <li>(9) Multiple casualty incidents</li> <li>(10) Damage to structures from impact and heat exposure</li> <li>(11) Serious vandalism or other criminal acts, such as bomb threats and terrorism</li> <li>(12) First aid or medical attention for motorists</li> <li>(13) Extreme weather conditions, such as heavy snow, rain, high winds, high heat, low temperatures, or sleet and ice, that cause disruption of operation</li> <li>(14) Earthquake</li> <li>(15) Hazardous materials accidentally or intentionally being released into the tunnel</li> </ul>	<p><b>A.13.2</b> The complexity of the interface between the operating authorities and the emergency responders should not be underestimated. The knowledge of safety related to a specific tunnel and the responses in case of an accident will differ, depending on the tunnel operator, the emergency services, and the users. Emergency response plans aim to ensure that tunnel users and fire and rescue services are exposed to the least risk. The tunnel operator understands the features available and should take appropriate action to implement procedures that will minimize the danger to occupants. The operator will call in the emergency services and generally follow a prescribed plan. The development of this plan and how it should be refined through exercises and training should also be addressed. The emergency services need knowledge of the tunnel details, technical systems, and operational possibilities to take control of the situation and begin the rescue operation with maximum safety, with a need to interpret possibly incomplete information in situations that can change rapidly, and to deal with human behavioral problems. More detail can be found in Fire in Tunnels Thematic Network, Technical Report 3: “Fire Response Management,” 2004.</p>
<p><b>Chapter 15: Periodic Testing</b></p> <p>15.1</p>	<p><b>15.1* Periodic Testing.</b></p>	<p><b>A.15.1</b> Periodic testing and mandatory testing after a major fire incident within the facility should be performed in accordance with NFPA 3.</p>

**NFPA 502: Standard for Road Tunnels, Bridges, and Other Limited Access Highways (2014 Edition)**

Section #	Section Text	Annex Text
15.1.1	<p><b>15.1.1</b> Fire protection, life safety, emergency ventilation, communication, traffic control, and electrical systems shall be inspected and tested for operational readiness and performance in accordance with the frequency requirements of the applicable NFPA standards or in accordance with 15.1.2.</p>	
15.1.2	<p><b>15.1.2</b> Integrated and/or interconnected fire protection, life safety, and emergency systems shall be inspected and tested for operational readiness and performance in accordance with the frequency requirements established by the basis of design or intervals not to exceed five years.</p>	

<b>NFPA 520: Standard on Subterranean Spaces (2010 Edition)</b>		
<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
none		

**NFPA 610: Guide for Emergency and Safety Operations at Motorsports Venues (2009 Edition)**

Section #	Section Text	Annex Text
<p><b>Chapter 4: Incident Action Plan</b></p> <p>4.7.2.1</p>	<p><b>4.7.2 Traffic Control Component.</b>  <b>4.7.2.1</b> The traffic control component should include plans for inbound and outbound flow of emergency vehicles and provisions for emergency evacuation of all or part of the site.</p>	
<p>4.7.2.2</p>	<p><b>4.7.2.2</b> The traffic control component should include the identification and method of contact for agencies or persons, or both agencies and persons, responsible for traffic flow management and emergency traffic scenarios.</p>	
<p>4.9.1</p>	<p><b>4.9 Critical Incident Stress Debriefing (CISD).</b>  <b>4.9.1</b> A process for identifying incidents in which critical incident stress is a significant hazard should be established and should include identifying personnel adversely affected by incident stress and promptly initiating critical incident stress debriefing (CISD).</p>	
<p><b>Chapter 5: Training</b></p> <p>5.2.2</p>	<p><b>5.2 Motorsports Safety Awareness Level.</b>  <b>5.2.2</b> It is not the intent of this guide to expect someone informed at the awareness level to take an aggressive role in reducing the severity of the incident. However, there might be actions the person could take as they move to a safe area, such as closing a door, shutting off a fuel valve on a burner, shutting off a power switch, or directing people away from the incident area, as these actions could reduce the severity of the incident without jeopardizing their own safety.</p>	

**NFPA 610: Guide for Emergency and Safety Operations at Motorsports Venues (2009 Edition)**

<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
<b>Chapter 7: Equipment</b>  7.1	<b>7.1 General.</b> The goal of emergency services personnel at any motorsports venue/event is to respond to an emergency situation with minimal time delays and with the necessary equipment to handle the incident and to protect persons from further injury.	

**NFPA 909: Code for the Protection of Cultural Resource Properties (2013 Edition)**

<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
none		

**NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs (2013 Edition)**

Section #	Section Text	Annex Text
<p><b>Chapter 5: Planning</b> 5.2</p>	<p><b>5.2* Risk Assessment.</b></p>	<p><b>A.5.2</b> Risk assessment is a process for identifying potential hazards/risk exposures and their relative probability of occurrence; identifying assets at risk; assessing the vulnerability of the assets exposed; and quantifying the potential impacts of the hazard/risk exposures on the assets. Periodic reassessment is needed when changes to the entity occur. Reassessment is also necessary because hazards/risk exposures change over time, and the collective knowledge of hazards/risk exposures develops over time.</p> <p>In addition to identifying hazards that could be the primary cause of an incident, consideration should also be given to those secondary hazards or cascading events that could cause additional impact to the entity and its assets. As an example, a fire could result in injury or death, property damage, interruption of operations, contamination of the environment, and negative attention on the entity. A comprehensive risk assessment identifies the range of hazard/risk exposures, including threats, hazards, or disruptive incidents, that have impacted or might impact the entity, the surrounding area, or the critical infrastructure supporting the entity. The potential impact of each threat, hazard/risk exposure, or disruptive incident is determined by the capabilities of the perpetrator, the magnitude of the hazard, and the scope of the incident, as well as the vulnerability of people, property, technology, the environment, and the entity's operations to the threat, hazard, or incident and the adequacy of existing mitigation. There are multiple methods to perform a risk assessment, but the entity should adhere to the following steps for conducting a comprehensive risk assessment:</p> <ol style="list-style-type: none"> <li>(1) Determine the methodology the entity will use to conduct the assessment and determine whether the entity has the necessary expertise to perform the assessment.</li> <li>(2) Consult with internal or external experts with the expertise to assess the vulnerability of the entity's assets from identified hazards.</li> <li>(3) Identify and categorize assets (human resources, buildings, equipment, operations, technology, electronic information, suppliers, vendors, third-party service providers, etc.).</li> <li>(4) Identify threats and hazards — natural, human caused (accidental and intentional), and technology caused.</li> <li>(5) Evaluate hazard/risk exposures to which the entity is exposed.</li> <li>(6) Assess the existing/current preventive measures and mitigation controls in place against credible threats.</li> <li>(7) Categorize threats, hazard/risk exposures, and potential incidents by their relative frequency and</li> </ol>

**NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs (2013 Edition)**

Section #	Section Text	Annex Text
		<p>severity. Keep in mind that there might be many possible combinations of frequency and severity for each, as well as cascading impacts.</p> <p>(8) Evaluate the residual hazard/risk exposures (those that remain hazardous after prevention and mitigation activities). Information from the risk assessment and impact analysis will help determine priorities for prevention and mitigation activities as well as prioritize development of plans and procedures. The entity should attempt to prevent, mitigate, prepare for, plan to respond to, and plan to recover from incidents that have significant potential to impact people; property; operational capabilities, including technology; the environment; and the entity itself.</p>
5.2.2.1	<p><b>5.2.2.1*</b> Hazards to be evaluated shall include the following:</p> <ul style="list-style-type: none"> <li>(1) Natural hazards (geologic, meteorologic, and biological)</li> <li>(2) Human-caused events (accidental and intentional)</li> <li>(3) Technology-caused events (accidental and intentional)</li> </ul>	<p><b>A.5.2.2.1</b> The following is an expanded list of hazards that should be considered during the risk assessment. Many hazards can be classified in multiple categories. A wildland fire might be caused by lightning or an intentional act. A fire in a chemical plant could be caused by human error or the failure of technology, such as a malfunctioning or improperly programmed control system. Hazards that should be considered during the risk assessment include natural hazards/risk exposures (geologic, meteorologic, and biological), human-caused events (accidental and intentional), and technology-caused incidents:</p> <ul style="list-style-type: none"> <li>(1) Geologic hazards/risk exposures <ul style="list-style-type: none"> <li>(a) Earthquake</li> <li>(b) Tsunami</li> <li>(c) Volcano</li> <li>(d) Landslide, mudslide, subsidence</li> </ul> </li> <li>(2) Meteorologic hazards/risk exposures <ul style="list-style-type: none"> <li>(a) Flood, flash flood, seiche, tidal surge</li> <li>(b) Water control structure (e.g., dam, levee) failure</li> <li>(c) Drought</li> <li>(d) Snow, ice, hail, sleet, avalanche, arctic freeze</li> <li>(e) Windstorm, tropical cyclone, hurricane, tornado, water spout, dust storm, sandstorm</li> <li>(f) Extreme temperatures (heat, cold)</li> <li>(g) Wildland fire</li> <li>(h) Lightning strikes</li> <li>(i) Famine</li> <li>(j) Geomagnetic storm</li> </ul> </li> <li>(3) Biological hazards/risk exposures <ul style="list-style-type: none"> <li>(a) Food-borne illnesses</li> <li>(b) Pandemic disease (e.g., avian flu, H1N1)</li> <li>(c) Infectious/communicable disease [e.g., plague, smallpox, anthrax, West Nile virus, foot and mouth disease, severe acute respiratory syndrome (SARS), bovine spongiform encephalopathy (BSE, or Mad Cow Disease)]</li> </ul> </li> <li>(4) Accidental human-caused events</li> </ul>

**NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs (2013 Edition)**

Section #	Section Text	Annex Text
		<p>(a) Hazardous material spill or release (flammable liquid; flammable gas; flammable solid; oxidizer; poison; explosive, radiological, or corrosive material)</p> <p>(b) Nuclear power plant incident, radiological incident</p> <p>(c) Explosion/fire</p> <p>(d) Transportation accident</p> <p>(e) Building/structure collapse</p> <p>(f) Entrapment and/or rescue (machinery, confined space, high angle, water)</p> <p>(g) Fuel/resource shortage</p> <p>(h) Mechanical breakdown</p> <p>(i) Transportation incidents (motor vehicle, railroad, watercraft, aircraft, pipeline)</p> <p>(j) Untimely death of employee</p> <p>(5) Intentional human-caused events</p> <p>(a) Strike or labor dispute</p> <p>(b) Criminal activity (vandalism, sabotage, arson, robbery, theft, fraud, embezzlement, data theft, malfeasance)</p> <p>(c) Physical or information security breach</p> <p>(d) Lost person, child abduction, kidnapping, extortion, hostage incident, workplace/school/university violence, homicide</p> <p>(e) Product defect or contamination</p> <p>(f) Disinformation</p> <p>(g) Harassment</p> <p>(h) Discrimination</p> <p>(i) Demonstrations, civil disturbance, public unrest, mass hysteria, riot</p> <p>(j) Bomb threat, suspicious package</p> <p>(k) Terrorism (explosive, chemical, biological, radiological, nuclear, cyber, electromagnetic pulse)</p> <p>(l) Insurrection</p> <p>(m) Enemy attack, war</p> <p>(n) Arson</p> <p>(6) Technology-caused incidents</p> <p>(a) Computer systems [outages, hardware failure, data corruption, deletion, theft, loss of network connectivity (Internet or intranet), loss of electronic data interchange or e-commerce, loss of domain name server (DNS), virus, worm, Trojan horse, power surge, lightning, host site interdependencies, direct physical loss, water damage, cyber terrorism, vulnerability exploitation, botnets, hacking, phishing, spyware, malware, computer fraud, loss of encryption, denial of service, improper system use by employee, telecommunications interruption or failure, electricity brownout or blackout]</p> <p>(b) Computer software or application interruption, disruption, or failure (internal/external)</p> <p>(c) Loss, corruption, or theft of electronic information</p> <p>(d) Utility interruption or failure (telecommunications,</p>

**NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs (2013 Edition)**

Section #	Section Text	Annex Text
		electrical power, water, gas, steam, HVAC, pollution control system, sewage system, other critical infrastructure)
5.2.3	<p><b>5.2.3</b> The entity shall conduct an analysis of the impacts of the hazards identified in 5.2.2 on the following:</p> <ul style="list-style-type: none"> <li>(1) Health and safety of persons in the affected area</li> <li>(2) Health and safety of personnel responding to the incident</li> <li>(3)*Continuity of operations</li> <li>(4)*Property, facilities, assets, and critical infrastructure</li> <li>(5) Delivery of the entity’s services</li> <li>(6) Supply chain</li> <li>(7) Environment</li> <li>(8)*Economic and financial conditions</li> <li>(9) Regulatory and contractual obligations</li> <li>(10) Reputation of or confidence in the entity</li> </ul>	
5.4.1	<p><b>5.4 Resource Needs Assessment.</b></p> <p><b>5.4.1*</b> The entity shall conduct a resource needs assessment based on the hazards identified in Section 5.2 and the business impact analysis in Section 5.3.</p>	<p><b>A.5.4.1</b> The entity should identify the resources necessary to support the program, plan for and procure needed resources, effectively manage resources that have been acquired to support operational needs, and establish mutual aid/partnership agreements as necessary. Resources should be available within the required time frame as required for emergency operations/response and to meet recovery time objectives. Resources should have the capability to perform their intended function. Scenarios developed during the risk assessment and business impact analysis should be used to identify resources needed by the program. Resources for emergency operations/response to protect life safety, stabilize the incident, and protect property should be identified. Resources required to execute recovery strategies within the recovery time objective also should be identified. The resource needs assessment should identify resource requirements necessary to achieve performance objectives.</p>
5.4.2	<p><b>5.4.2</b> The resource needs assessment shall include the following:</p> <ul style="list-style-type: none"> <li>(1)*Human resources, equipment, training, facilities, funding, expert knowledge, materials, technology, information, intelligence, and</li> </ul>	<p><b>A.5.4.2(1)</b> The resource needs assessment might include “credentialing,” which addresses the need for individuals licensed (e.g., doctors, engineers) in one jurisdiction (state or country) performing their professional duties (as volunteers or under mutual aid compacts) during an incident in a jurisdiction where they are not licensed or do not hold the proper credentials. Credentialing provides minimum professional qualifications, certifications,</p>

**NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs (2013 Edition)**

Section #	Section Text	Annex Text
	<p>the time frames within which they will be needed                      (2) Quantity, response time, capability, limitations, cost, and liabilities</p>	<p>training, and education requirements that define the standards required for specific emergency response functional assignments.</p>
5.4.3	<p><b>5.4.3*</b> The entity shall establish procedures to locate, acquire, store, distribute, maintain, test, and account for services, human resources, equipment, and materials procured or donated to support the program.</p>	<p><b>A.5.4.3</b> All program equipment should be checked and tested on a regularly scheduled basis to ensure it will function properly when required. This might include vehicles, personal protective equipment (PPE), radio, information technology equipment, and warning and alerting devices and equipment, including sirens, special emergency response equipment, and so forth. Resources can be prepositioned to expedite deployment. These resources can include the following:                      (1) Locations, quantities, accessibility, operability, and maintenance of equipment                      (2) Supplies (medical, personal hygiene, consumable, administrative, ice)                      (3) Sources of energy (electrical, fuel)                      (4) Emergency power                      (5) Communications systems                      (6) Food and water                      (7) Technical information                      (8) Clothing                      (9) Shelter                      (10) Specialized human resources (medical, faith-based, and volunteer organizations; emergency management staff; utility workers; morticians; and private contractors)                      (11) Employee and family assistance</p>
<p><b>Chapter 6: Implementation</b></p> <p>6.1.1</p>	<p><b>6.1 Common Plan Requirements.</b>  <b>6.1.1*</b> Plans shall address the health and safety of personnel.</p>	<p><b>A.6.1.1</b> The safety and health of personnel are critical to the successful execution of the program. When every person accepts and performs as if safety and health are their personal responsibility, hazardous exposures will be minimized and the probability of accidents and incidents will be reduced. Hazard/risk exposure can be eliminated or minimized by removing the hazards or by not performing the hazardous task. However, complete elimination of risk is not always be feasible, and controls should then be instituted. Hazard control begins with identification of the hazard and the vulnerability of people or assets potentially exposed and elimination or mitigation according to the hierarchy of controls as follows:                      (1) <i>Elimination or substitution.</i> Whenever possible, the hazard should be eliminated from the work area (e.g., repairing or removing fallen electrical power lines before allowing other work to proceed in the area). Although desirable, elimination or substitution might not be options for most airborne/chemical hazards created by an incident.                      (2) <i>Engineering controls.</i> Steps should be taken to reduce or eliminate exposure to a hazard through engineering</p>

**NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs (2013 Edition)**

Section #	Section Text	Annex Text
		<p>controls such as the installation of ventilation systems, automatic sprinklers (building), or special protection systems.</p> <p>(3) <i>Administrative controls.</i> Work practices should be implemented that reduce the duration, frequency, and severity of risk exposures. Safety and health controls include training, safety procedures, observations, and enforcement of safe behavior, for example, using well-rested crews and daylight hours to perform higher hazard or unfamiliar tasks, requiring frequent breaks during hot weather, removing nonessential personnel from the area during certain tasks/operations, and decontaminating equipment and personnel after contact with contaminated floodwater or chemicals, and when possible, using water to suppress dust and work upwind in dusty conditions.</p> <p>(4) <i>Personal protective equipment (PPE).</i> If hazard exposures cannot be engineered or administratively controlled, individuals should be shielded or isolated from chemical, physical, and biological hazards through the use of PPE. Careful selection and use of adequate PPE should protect the respiratory system, skin, eyes, face, hands, feet, head, body, and hearing. Examples of PPE are safety glasses and goggles for eyes, gloves for hands, and respirators to protect the lungs. Control of the hazard exposures should not stop with providing PPE. Incident management systems (IMs) have trained, designated incident safety officers, but hazard exposure control should be a paramount concern of every person involved. Recovery operations can be particularly hazardous. Due to the nature of the recovery, normal operations might be disrupted and the hazards uncontrolled. For example, work conditions change drastically after hurricanes and other natural disasters. In the wake of a hurricane, response and recovery workers face additional challenges, such as downed power lines, downed trees, and high volumes of construction debris, while performing an otherwise familiar task or operation. Procedures and training are needed to help ensure safe performance of those engaged in cleanup after an incident. Corrective actions to eliminate or mitigate hazard exposure should be aggressive and complete, but they also should be carefully considered before implementation so as not to create a new set of hazard exposures.</p>
6.2.1	<p><b>6.2 Prevention.</b>  <b>6.2.1*</b> The entity shall develop a strategy to prevent an incident that threatens life, property, and the environment.</p>	<p><b>A.6.2.1</b> Common prevention and deterrence strategies include the following:</p> <p>(1) Security patrols inside and outside facilities; increased inspections of vehicles entering the facility; background checks of personnel</p> <p>(2) Access controls, including perimeter fence line and gates, access control systems, camera surveillance,</p>

**NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs (2013 Edition)**

Section #	Section Text	Annex Text
		intruder detection systems (motion-sensing cameras, infrared detectors) (3) Immunizations, isolation, or quarantine (4) Land use restrictions to prevent development in hazard prone areas, such as flooding areas or construction of hazardous materials facilities in areas near schools, in population centers, or in areas of identified critical infrastructure (5) Uninterruptible power supply (UPS) to provide short term backup power to critical electrical components, including the data center power distribution unit (PDU), desktop computers in time-sensitive operational areas, phone switchboard (PBX), the HVAC system, and safety controls such as elevators and emergency lighting (6) Gasoline- or diesel-powered generators to provide long term backup power (7) Crime prevention through environmental design (CPTED), including site layout, landscape design, and exterior lighting (8) Personnel management (9) Background investigations (10) Cyber security, including firewalls, intrusion detection, virus protection, password management, cryptographic key management, and access to information based on need to know
6.2.3	<b>6.2.3</b> The prevention strategy shall be based on the results of hazard identification and risk assessment, an analysis of impacts, program constraints, operational experience, and a cost-benefit analysis.	
6.2.4	<b>6.2.4</b> The entity shall have a process to monitor the identified hazards and adjust the level of preventive measures to be commensurate with the risk.	
6.8.1	<b>6.8 Emergency Operations/Response Plan.</b> <b>6.8.1*</b> Emergency operations/response plans shall define responsibilities for carrying out specific actions in an emergency.	
6.8.2	<b>6.8.2*</b> The plan shall identify actions to be taken to protect people, including those with access and functional needs, property, operations, the environment, and the entity.	

**NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs (2013 Edition)**

<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
6.8.4	<b>6.8.4</b> The plan shall include the following: (1) Protective actions for life safety in accordance with 6.8.2. (2) Warning, notifications, and communication in accordance with Section 6.5. (3) Crisis communication and public information in accordance with Section 6.4 (4) Resource management in accordance with 6.7.7 (5) Donation management in accordance with 6.7.9	

<b>NFPA 1620: Standard for Pre-Incident Planning (2010 Edition)</b>		
<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
<p><b>Chapter 6: Occupant Considerations</b></p> <p>6.2.1.1</p>	<p><b>6.2 Life Safety Considerations.</b> <b>6.2.1 General.</b> <b>6.2.1.1</b> Life safety considerations shall be addressed to allow emergency responders to assist in the evacuation of a facility or to support defend-in-place/remain-in-place strategies.</p>	
<p><b>Chapter 8: Special Hazards</b></p> <p>8.1</p>	<p><b>8.1* General.</b> The pre-incident plan shall identify and document any special hazards recognized by the authority having jurisdiction that present extraordinary life safety challenges, operations challenges, or other challenges to emergency responders.</p>	<p><b>A.8.1</b> Pre-incident planning for facilities where hazardous materials are present should record the following:</p> <ol style="list-style-type: none"> <li>(1) Impact on emergency operations</li> <li>(2) Specific hazard(s) of the materials</li> <li>(3) Quantity and type of materials present and container type(s)</li> <li>(4) Engineering controls</li> <li>(5) Containment systems</li> <li>(6) Fire suppression systems</li> <li>(7) Special fire-fighting requirements</li> </ol>
8.4.2	<p><b>8.4.2 Hazardous Materials.</b> Where the storage or use of hazardous materials has been identified as a special hazard, the pre-incident plan shall include the specifications of 8.4.2.1 through 8.4.2.5.2.</p>	
8.4.2.3	<p><b>8.4.2.3* Toxic or Biological Agents.</b></p>	<p><b>A.8.4.2.3</b> Special notation should be made of the special protective equipment that might be needed, location and identity of the agents, special security features and procedures, entry precautions and procedures, and special containment features, including locked storage, <i>in vivo</i> or <i>in vitro</i> use.</p>
8.4.2.4	<p><b>8.4.2.4* Radioactive Materials.</b></p>	<p><b>A.8.4.2.4</b> Small radioactive sources used in laboratory, manufacturing, health care, or other occupancies could pose significant risks if removed from their storage or shielding. Information should be included about special entry requirements or security procedures and alarms for equipment such as lasers, irradiators, or other areas or devices that could result in exposure to responders.</p>
8.4.2.5	<p><b>8.4.2.5* Reactive Chemicals and Materials.</b></p>	<p><b>A.8.4.2.5</b> Many chemicals can produce an adverse reaction if contaminated or mixed with other materials chemicals could also undergo a chemical reaction when exposed to elevated temperatures as in a fire and have the potential for buildup of pressure in containers and the generation of toxic byproducts and heat. Reactive chemicals that require cooling, for example, in a refrigerated warehouse, should also be noted, because it is likely that power could be interrupted during an emergency. Plan for any chemical processes that could become hazardous if interrupted or left unattended (e.g.,</p>

**NFPA 1620: Standard for Pre-Incident Planning (2010 Edition)**

<b>Section #</b>	<b>Section Text</b>	<b>Annex Text</b>
		during the building evacuation). Materials that react upon exposure to air or water should also be documented on the pre-incident plan. Include information about any secondary containment to prevent exposure to hazardous conditions.
8.4.3	<b>8.4.3* Special Atmospheres.</b> Any area of an occupancy that contains rooms or equipment storing or using special gases or vapors that can present a hazard to the emergency responders shall be identified in the pre-incident plan.	<b>A.8.4.3</b> Examples of places that might contain hazardous atmospheres include the following: (1) Confined spaces (2) Inert atmospheres (3) Ripening facilities (4) Special equipment treating atmospheres (5) Fumigation chambers or active fumigation operation (6) Magnetic resonance imaging (MRI) quench gases