Chapter 21, Emergency Control Functions and Interfaces

Summary. Chapter 21 is new. These requirements were formerly found in Chapter 6, Protected Premises Fire Alarm Systems. The term “fire safety function” is replaced by the term “emergency control function”. New section called First Responders Use Elevators. New section called Elevators for Occupant-Controlled Evacuation.

Chapter 21 Protected Premises Fire-Safety Emergency Control Functions and Interfaces

21.1 Application. The provisions of Section 6.16 shall cover the minimum requirements for the interconnection of protected premises fire safety emergency control functions (e.g., fan control, door control) to the fire alarm system and emergency communications systems in accordance with and (sic) 21.2.1 through 21.2.3 and 23.8.1.1.

21.1.1 The requirements of Chapters 10, 17, 18, 23, 24 and 26 shall also apply, unless they are in conflict with this chapter.

21.1.2 The requirements of Chapter 14 shall apply.

21.1.3 The requirements of this chapter shall not apply to Chapter 29 unless otherwise noted.

21.2 General.

21.2.1* Fire safety Emergency control functions shall be permitted to be performed automatically.

21.2.2 The performance of automatic emergency control functions shall not interfere with power for lighting or for operating elevators.

21.2.3 The performance of automatic emergency control functions shall not preclude the combination of fire alarm services with other services requiring monitoring of operations.

21.2.4* A listed relay or other listed appliance connected to the fire alarm system used to initiate control of protected premises emergency control functions shall be located within 3 ft (1 m) of the controlled circuit or appliance.

21.2.6 The installation wiring between the fire alarm control unit and the relay or other appliance shall be monitored for integrity Class A, Class B, Class D, or Class X in accordance with Chapter 12.

Exception: Relays or appliances that operate on loss of power shall be considered self-monitoring for integrity.

21.2.7 Fire safety Emergency control functions shall not interfere with other operations of the fire alarm system.
21.2.12 The operation of all fire safety emergency control functions shall be verified by an operational test at the time of system acceptance.

21.3* Elevator Recall for Fire Fighters’ Service.

A.21.3 The terms machinery space, control space, machine room, and control room are defined in NFPA 70, National Electrical Code, and ANSI/ASME A17.1a/CSA B44.

21.3.1 System type smoke detectors, or other automatic fire detection as permitted by 6.16.3.7, located in elevator lobbies, elevator hoistways, and elevator machine rooms including machine space, control room, and control space. All initiating devices used to initiate fire fighters’ service recall shall be connected to the building fire alarm system.

21.3.2* In facilities without a building fire alarm system, these smoke detectors or other automatic fire detection as permitted by 6.16.3.7 initiating devices used to initiate fire fighters’ service recall shall be connected to a dedicated function fire alarm control unit that shall be designated as “elevator recall control and supervisory control unit,” permanently identified on the dedicated function fire alarm control unit and on the record drawings.

21.3.3 Unless otherwise required by the authority having jurisdiction, only the elevator lobby, elevator hoistway, and elevator machine room smoke detectors, or other automatic fire detection as permitted by 21.3.7, and initiating devices used to initiate shutdown of elevator power in accordance with Section 21.4 shall be used to recall elevators for fire fighters’ service.

21.3.4 Each elevator lobby, elevator hoistway, and elevator machine room smoke detector, or other automatic fire detection as permitted by 6.16.3.7, initiating device used to initiate fire fighters’ service recall shall be capable of initiating elevator recall when all other devices on the same initiating device circuit have been manually or automatically placed in the alarm condition.

21.3.9 Actuation from the elevator hoistway, elevator machine room, elevator machinery space, elevator control space, or elevator control room smoke detectors, or other automatic fire detection as permitted by 21.3.7, shall cause separate and distinct visible annunciation at the building fire alarm control unit, or the fire alarm control unit described in 21.3.2, and at required Annunciators to alert fire fighters and other emergency personnel that the elevators are no longer safe to use.

21.3.12.1 Designated Level Recall. For each elevator or group of elevators, an output shall be provided to signal elevator recall to the designated level in response to the following:

1. Activation of smoke detectors, or other automatic fire detection as permitted by 21.3.7, located at any elevator lobby served by the elevator(s) other than the lobby at the designated level.
2. Activation of smoke detectors, or other automatic fire detection as permitted by 21.3.7, located at any elevator machine room, elevator machinery space, elevator control space, or elevator control room serving the elevator(s), except where the machine room such rooms or spaces is are located at the designated level.
(3) Activation of smoke detectors, or other automatic fire detection as permitted by 21.3.7, located in the elevator hoistway serving the elevator where sprinklers are located in the hoistway, unless otherwise specified in 21.3.12.2(3)

21.3.12.2 Alternate Level Recall. For each elevator or group of elevators, an output shall be provided to signal elevator recall to the alternate level in response to the following:

(1) Activation of smoke detectors, or automatic fire detection as permitted by 21.3.7, located at the designated level lobby served by the elevator(s)

(2) Activation of smoke detectors, or other automatic fire detection as permitted by 21.3.7, located in the elevator machine room, elevator machinery space, elevator control space, or elevator control room serving the elevator(s) if the machine room such rooms or spaces is are located at the designated level

(3) *Activation of the initiating devices identified in 21.3.12.1(3) if they are installed at or below the lowest level of recall in the elevator hoistway and the alternate level is located above the designated level

21.3.12.3* Visual Warning. For each elevator or group of elevators, an output(s) shall be provided for the elevator visual warning signal in response to the following:

(1) Activation of the elevator machine room, elevator machinery space, elevator control space, or elevator control room initiating devices identified in 21.3.12.1(2) or 21.3.12.2(2)

(2) Activation of the elevator hoistway initiating devices identified in 21.3.12.1(3) or 21.3.12.2(3)

21.4.2* If heat detectors are used to shut down elevator power prior to sprinkler operation, they shall be placed within 24 in. (610 mm) of each sprinkler head and be installed in accordance with the requirements of Chapter 17. Alternatively, engineering methods, such as those specified in Annex B, shall be permitted to be used to select and place heat detectors to ensure response prior to any sprinkler head operation under a variety of fire growth rate scenarios.

A.21.4.2 Upon activation of the heat detector used for elevator power shutdown, there should be a delay in the activation of the power shunt trip. This delay should be the time that it takes the elevator cab to travel from the top of the hoistway to the lowest recall level.

21.5 First Responders Use Elevators. Where one or more elevators are specifically designated and marked for use by first responders during fires, the conditions specified in 21.5.1 for the elevators, associated lobbies, and machine rooms shall be continuously monitored and displayed during any such use.

21.5.1 The conditions monitored and displayed shall include, but are not limited to, the following:

(1) Availability of main and emergency power to operate the elevator(s), elevator controller(s), and machine room (if provided) ventilation

(2) Status of the elevator(s), including location within the hoistway, direction of travel, position of landing doors, and whether they are occupied
NFPA 72-2010 Changes

(3) Temperature and presence of smoke in associated lobbies and machine room (if provided)

21.5.2 The conditions shall be displayed on a standard emergency services interface complying with Section 18.11.

21.6 Elevators for Occupant-Controlled Evacuation.

21.6.1 Where one or more elevators are specifically designated and marked for use by occupants for evacuation during fires, they shall comply with all of the provisions of Section 21.5.

21.6.2 The lobbies of elevators required by other governing codes or standards for use by occupants for evacuation in fires shall be provided with a status indicator complying with Chapter 18.

21.6.2.1 The required status indicator shall display an illuminated green light and the message “Elevators available for occupant evacuation” while the elevators are operating under normal service and the fire alarm system is in an alarm condition, but before Phase I Emergency Recall Operation in accordance with ANSI/ASME A.17.1a/CSA B44a, *Safety Code for Elevators and Escalators*, has been initiated.

21.6.2.2 The required status indicator shall display an illuminated red light and the message “Elevators out of service, use exit stairs” once the elevators are under Phase I or Phase II operation in accordance with ANSI/ASME A17.1a/CSA B44a, *Safety Code for Elevators and Escalators*.

21.7.3* Connections between fire alarm systems and the HVAC system for the purpose of monitoring and control shall operate and be monitored in accordance with applicable NFPA standards.

A.21.7.3 This standard does not specifically require detection devices used to cause the operation of HVAC system smoke dampers, fire dampers, fan control, smoke doors, and fire doors to be connected to the fire alarm system. Connection to the fire alarm system would be determined by the requirements established by the authority having jurisdiction. See A.1.2.4.

21.9 Electrically Locked Doors.

21.9.1 Any device or system intended to actuate the locking or unlocking of exits electrically lock a required means of egress door in the direction of egress shall be connected to the fire alarm system serving the protected premises.

21.9.2* All exits connected in accordance with 6.16.7.1 Electrically locked doors in a required means of egress shall unlock upon receipt of any fire alarm signal by means of the fire alarm system serving the protected premises in the direction of egress as prescribed by other laws, codes, and governing standards.

*Exception: Where otherwise required or permitted by the authority having jurisdiction or other codes.*

A.21.9.2 Doors are commonly locked for various security reasons. Though doors are permitted to be locked to prevent ingress, doors are generally not permitted to be locked to restrict egress unless specifically permitted by governing laws, codes, and standards. Examples of special locking arrangements include delayed-egress locking and access...
control locking. Approved locking requirements by governing laws, codes, and standards can vary extensively. For example, some might require all fire alarm initiating devices to immediately unlock electrically locked egress doors, while others might permit such doors to remain locked when a single manual fire alarm box is activated. Some codes might also permit electrically locked doors to remain locked when a single smoke detector has activated. These allowances are typically permitted only in sprinklered buildings and are generally used as additional safeguards to counter efforts to breach security, without compromising occupant safety.

21.9.3* For all exits means of egress doors connected in accordance with 21.9.1, and where batteries are used in accordance with 10.5.6.1.1(1) as the secondary power supply, the batteries shall not be utilized to maintain these doors in the locked condition, unless the fire alarm control unit is arranged with circuitry and sufficient secondary power to ensure the exits will unlock within 10 minutes of loss of primary power.

21.9.5 If exit means of egress doors are unlocked by the fire alarm system, the unlocking function shall occur prior to, or concurrent with, activation of any public-mode notification appliances in the area(s) served by the normally locked exits means of egress doors.


21.10.1 Where required by other governing laws, codes, standards, or the authority having jurisdiction, exit marking audible notification appliances shall be activated by the building fire alarm system.