

## SUPPLEMENT 2

# Extracts from ASME Elevator Code and Handbook

*Editor's Note: This supplement provides the reader with detailed information on elevator emergency operation and signaling devices. It consists of extracted material from ASME A17.1, Safety Code for Elevators and Escalators, 2007, and its accompanying handbook.*

### EXTRACTS FROM ASME A17.1, SECTION 2.27 EMERGENCY OPERATION AND SIGNALING DEVICES\*

NOTE (2.27): Additional requirements, including those for firefighters' communications systems, may be found in the building code.

#### 2.27.1 Car Emergency Signaling Devices

##### 2.27.1.1 Emergency Communications

2.27.1.1.1 A two-way communications means between the car and a location staffed by authorized personnel shall be provided.

2.27.1.1.2 When the two-way communications location is not staffed 24 h a day, by authorized personnel who can take appropriate action, the means of two-way communications shall automatically be directed within 30 s to an additional on- or off-site location, staffed by authorized personnel, where an appropriate response can be taken.

2.27.1.1.3 The two-way communication means within the car shall comply with the following requirements:

- (a) In jurisdictions enforcing NBCC, Appendix E of CSA B44, or in jurisdictions not enforcing NBCC, ICC/ANSI A117.1.
- (b) A push button to actuate the two-way communication means shall be provided in or adjacent to a

car operating panel. The push button shall be visible and permanently identified as "HELP". The identification shall be on or adjacent to the "HELP" button. When the push button is actuated, the emergency two-way communication means shall initiate a call for help and establish two-way communications.

- (c) A visual indication on the same panel as the "HELP" push button shall be provided, that is activated by authorized personnel, to acknowledge that two-way communications link has been established. The visual indication shall be extinguished when the two-way communication link is terminated.
- (d) The two-way communication means shall provide on demand to authorized personnel, information that identifies the building location and elevator number and that assistance is required.
- (e) After the call acknowledgement signals are sent [2.27.1.1.3(c)], the two-way voice communications shall be available between the car and authorized personnel.
- (f) The two-way communications, once established, shall be disconnected only when authorized personnel outside the car terminate the call.
- (g) The two-way communication means shall not use a handset in the car.
- (h) The two-way communications shall not be transmitted to an automated answering system. The call for help shall be answered by authorized personnel.
- (i) Operating instructions shall be incorporated with or adjacent to the "HELP" button.

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2.27.1.1.4 Where the elevator rise is 18 m (60 ft) or more, a two-way voice communication means within the building accessible to emergency personnel shall be provided and comply with the following requirements:

- (a) The means shall enable emergency personnel within the building to establish two-way voice communications to each car individually. Two-way voice communication shall be established without any intentional delay and shall not require intervention by a person within the car. The means shall override communications to outside of the building.
- (b) Two-way voice communications, once established, shall be disconnected only when emergency personnel outside the car terminates the call.
- (c) Once the two-way voice communication has been established, the visual indication [see 2.27.1.1.3(c)] within the car shall illuminate. The visual indication shall be extinguished when the two-way communication is terminated.
- (d) Operating instructions shall be incorporated with or adjacent to the two-way voice communication outside the car. Instructions shall conform to 2.27.7.3.

2.27.1.1.5 If the emergency communication means is normally connected to the building's main power supply, it shall automatically transfer to an alternate source(s) of power when the normal power supply fails. The alternate source(s) of power (standby, emergency, etc.) shall be capable of providing power for illumination of the visual indication [see 2.27.1.1.3(c)] within the car, and the means of emergency communications for at least 4 h; and the audible signaling device (see 2.27.1.2) for at least 1 h.

#### 2.27.1.2 Emergency Stop Switch Audible Signal.

When an emergency stop switch (2.26.2.5) is provided, an audible signaling device shall be provided. The audible signaling device shall

- (a) have a rated sound pressure rating of not less than 80 dBA nor greater than 90 dBA at 3 m (10 ft)
- (b) respond without delay after the switch has been activated
- (c) be located inside the building and audible inside the car and outside the hoistway
- (d) for elevators with a rise greater than 30 m (100 ft), be duplicated as follows:
  - (1) one device shall be mounted on the car
  - (2) a second device shall be placed at the designated level

#### 2.27.2 Emergency or Standby Power System

Where an emergency or standby power system is provided to operate an elevator in the event of normal power supply failure, the requirements of 2.27.2.1 through 2.27.2.5 shall be complied with.

2.27.2.1 The emergency or standby power system shall be capable of operating the elevator(s) with rated load (see 2.16.8), at least one at a time, unless otherwise required by the building code.

2.27.2.2 The transfer between the normal and the emergency or standby power system shall be automatic.

2.27.2.3 An illuminated signal marked "ELEVATOR EMERGENCY POWER" shall be provided in the elevator lobby at the designated level to indicate that the normal power supply has failed and the emergency or standby power is in effect.

2.27.2.4 Where the emergency or standby power system is not capable of operating all elevators simultaneously, requirements of 2.27.2.4.1 through 2.27.2.4.5 shall be conformed to.

2.27.2.4.1 A selector switch(es) marked "ELEVATOR EMERGENCY POWER" in red lettering a minimum of 5 mm (0.25 in.) in height, that is key-operated or under a locked cover (see 2.27.8), shall be provided to permit the selection of the elevator(s) to operate on the emergency or standby power system. The key shall be Group 3 Security (see 8.1).

2.27.2.4.2 The selector switch(es) positions shall be marked to correspond with the elevator identification number (see 2.29) and a position marked "AUTO."

2.27.2.4.3 The selector switch(es) shall be located at the designated level in view of all elevator entrances, or if located elsewhere means shall be provided adjacent to the selector switch(es) to indicate that the elevator is at the designated level with the doors in the normally open position.

2.27.2.4.4 When the selector switch is in the "AUTO" position, automatic power selection shall be provided, that will return each elevator that is not on designated attendant operation, inspection operation, or Phase II In-Car Emergency Operation, one or more at a time, to the recall level. Failure of the selected car to move shall cause power to be transferred to another car.

2.27.2.4.5 The selector switch(es) positions corresponding to the elevator identification numbers (see 2.29.1) shall override the automatic power selection. Operation of the selector switch(es) shall not cause

power to be removed from any elevator until the elevator is stopped.

NOTE (2.27.2.4): The selector switch(es) should normally be placed in the "AUTO" position.

**2.27.2.5** When the emergency or standby power system is designed to operate only one elevator at a time, the energy absorption means (if required) shall be permitted to be located on the supply side of the elevator power disconnecting means, provided all other requirements of 2.26.10 are conformed to when operating any of the elevators the power might serve. Other building loads, such as power and lights that can be supplied by the emergency or standby power system, shall not be considered as a means of absorbing the re-generated energy for the purposes of conforming to 2.26.10, unless such loads are normally powered by the emergency or standby power system.

### 2.27.3 Firefighters' Emergency Operation: Automatic Elevators

Firefighters' Emergency Operation shall apply to all automatic elevators except where the hoistway or a portion thereof is not required to be fire-resistive construction (see 2.1.1.1), the rise does not exceed 2 000 mm (80 in.), and the hoistway does not penetrate a floor.

NOTE (2.27.3): When the structure (building, etc.) is located in a flood hazard area, the alternate and designated levels (see 8.12.1) should be above the base flood elevation.

#### 2.27.3.1 Phase I Emergency Recall Operation

**2.27.3.1.1** A three-position key-operated switch that will not change position without a deliberate action by the user, shall be

- (a) provided only at the designated level for each single elevator or for each group of elevators.
- (b) labeled "FIRE RECALL" and its positions marked "RESET," "OFF," and "ON" (in that order), with the "OFF" position as the center position. The "FIRE RECALL" letters shall be a minimum of 5 mm (0.25 in.) high in red or a color contrasting with a red background.
- (c) located in the lobby within sight of the elevator or all elevators in that group and shall be readily accessible.

**2.27.3.1.2** An additional key-operated "FIRE RECALL" switch, with two positions that will not change position without a deliberate action by the user, marked "OFF" and "ON" (in that order), shall be permitted only at the building fire control station.

**2.27.3.1.3** The switch(es) shall be rotated clockwise to go from the "RESET" (designated level switch only), to "OFF" to "ON" positions. Keys shall be removable only in the "OFF" and "ON" positions.

**2.27.3.1.4** Only the "FIRE RECALL" switch(es) or fire alarm initiating device located at floors that are served by the elevator, or in the hoistway, or in an elevator machine room, or a control space, or a control room (see 2.27.3.2) shall initiate Phase I Emergency Recall Operation.

**2.27.3.1.5** All "FIRE RECALL" switches shall be provided with an illuminated visual signal to indicate when Phase I Emergency Recall Operation is in effect.

**2.27.3.1.6** When a "FIRE RECALL" switch is in the "ON" position all cars controlled by the switch shall operate as follows:

- (a) A car traveling towards the designated level shall continue nonstop to the designated level and power-operated doors shall open and remain open.

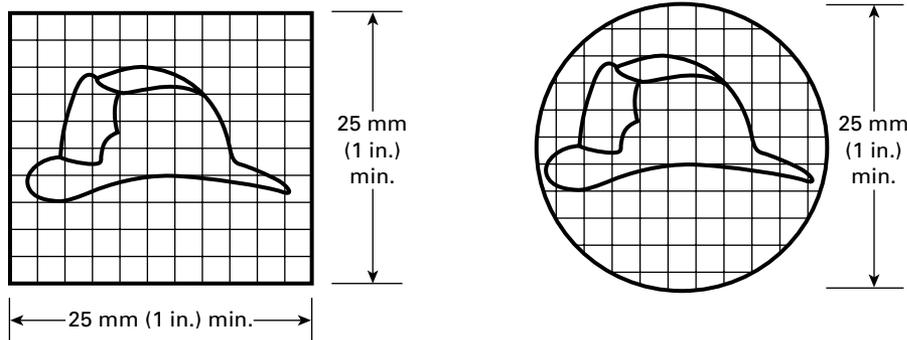
On cars with two entrances, if both entrances can be opened at the designated level, only the doors serving the lobby where the "FIRE RECALL" switch is located shall open and remain open.

- (b) A car traveling away from the designated level shall reverse at or before the next available landing without opening its doors and proceed to designated level.
- (c) A stopped car shall have the in-car stop switch (see 2.26.2.21) and the emergency stop switch in the car (see 2.26.2.5) when provided, rendered inoperative as soon as the car moves away from the landing. A moving car shall have the in-car stop switch and the emergency stop switch in the car when provided, rendered inoperative without delay. Once the emergency stop switch in the car and the in-car stop switch have been rendered inoperative, they shall remain inoperative while the car is on Phase I Emergency Recall Operation. All other stop switches required by 2.26.2 shall remain operative.
- (d) A car standing at a landing other than the designated level, with the doors open and the in-car stop switch and the emergency stop switch in the car when provided, in the run position, shall conform to the following:

- (1) Elevators having automatic power-operated horizontally sliding doors shall close the doors without delay and proceed to the designated level.
- (2) Elevators having power-operated vertically sliding doors provided with automatic or

momentary pressure closing operation per 2.13.3.4 shall have the closing sequence initiated without delay in accordance with 2.13.3.4.1, 2.13.3.4.2, 2.13.3.4.3, and 2.13.3.4.5, and the car shall proceed to the designated level.

- (3) Elevators having power-operated doors provided with continuous pressure closing operation (see 2.13.3.2), or elevators having manual doors, shall be provided with a visual and audible signal system [see 2.27.3.1.6(h)] to alert an operator to close the doors and shall, when the doors are closed, proceed to the designated level. Sequence operation, if provided, shall remain effective.
- (e) Door reopening devices for power-operated doors that are sensitive to smoke or flame shall be rendered inoperative without delay. Door reopening devices not sensitive to smoke or flame (e.g., mechanically actuated devices) are permitted to remain operative. Door closing for power-operated doors shall conform to 2.13.5.
- (f) All car and corridor call buttons shall be rendered inoperative. All call-registered lights and directional lanterns shall be extinguished and remain inoperative. Car position indicators, where provided, shall remain operative. Where provided, landing position indicators shall be extinguished and remain inoperative, except at the designated level and the building fire control station, where they shall remain operative.
- (g) Where provided on elevators with vertically sliding doors, corridor door open and door close buttons shall remain operative.
- (h) An illuminated visual and audible signal system shall be activated. The visual signal shall be one of the symbols shown in Exhibit S2.1 and located on the car-operating panel. The entire circular or square area or the outline of the hat, or the outline of the area shown in Exhibit S2.1 shall be illuminated. The visual signal shall remain activated until the car is restored to automatic operation. When the door is open, the audible signal shall remain active until the door is closed. When the door is closed, the audible signal shall remain active for a minimum of 5 s. The audible signal shall not be active when the car is at the recall level.
- (i) A car stopped at a landing shall have the in-car door open button rendered inoperative as soon as the car moves away from the landing. The in-car door open button shall remain inoperative when a car stops to reverse direction. Once the in-car door open button has been rendered inoperative, it shall remain inoperative until the car has returned to the designated level.
- (j) Where an additional "FIRE RECALL" switch is provided, both "FIRE RECALL" switches shall be in the "ON" position to recall the elevator to the designated level if the elevator was recalled to the alternate level (see 2.27.3.2.4).
- (k) To remove the elevator(s) from Phase I Emergency Recall Operation, the "FIRE RECALL" switch shall be rotated first to the "RESET," and then to the "OFF" position, provided that
- (1) the additional two-position "FIRE RECALL" switch, where provided, is in the "OFF" position
  - (2) no fire alarm initiating device is activated (see 2.27.3.2).
- (l) Means used to remove elevators from normal operation shall not prevent Phase I Emergency Recall Operation, except
- (1) as specified in this Code
  - (2) as controlled by elevator personnel
- (m) No device, that measures load, shall prevent operation of the elevator at or below the capacity and loading required in 2.16.



**Exhibit S2.1** Visual Signal. [From ASME A17.1, Section 2.27, Fig. 2.27.3.1.6(h)]

GENERAL NOTE: Grid is for scaling purposes only.

(n) If the normal power supply, emergency power supply, and standby power supply are not available and the elevator is equipped with an alternate source of power that is insufficient to move the car to the recall level, the following requirements shall apply:

- (1) The visual signal [2.27.3.1.6(h)] shall extinguish.
- (2) A car that is not at a landing shall move to the closest landing it is capable of reaching.
- (3) A car that has automatic power-operated horizontally sliding doors or power-operated vertically sliding doors provided with automatic closing operation and is stopped at a landing, shall open the doors, and then within 15 s, initiate reclosing.
- (4) A car that is stopped at a landing shall have its door open button operative.
- (5) A car stopped at a landing shall not move until normal power, emergency power, or standby power becomes available.

### 2.27.3.2 Phase I Emergency Recall Operation by Fire Alarm Initiating Devices

2.27.3.2.1 In jurisdictions not enforcing the NBCC, fire alarm initiating devices used to initiate Phase I Emergency Recall Operation shall be installed in conformance with the requirements of NFPA 72, and shall be located

- (a) at each floor served by the elevator
- (b) in the associated elevator machine room, control space, or control room
- (c) in the elevator hoistway, when sprinklers are located in those hoistways

2.27.3.2.2 In jurisdictions enforcing the NBCC, smoke detectors, or, if applicable, the building fire alarm system (fire alarm initiating devices), used to initiate Phase I Emergency Recall Operation, shall be installed in conformance with the requirements of the NBCC, and shall be located in

- (a) each elevator lobby
- (b) the machine room

NOTE (2.27.3.2.2): Fire alarm initiating devices are referred to as fire detectors in the NBCC.

2.27.3.2.3 Phase I Emergency Recall Operation to the designated level shall conform to the following:

- (a) The activation of a fire alarm initiating device specified in 2.27.3.2.1 or 2.27.3.2.2(a) at any floor, other than at the designated level, shall cause all elevators that serve that floor, and any associated

elevator of a group automatic operation, to be returned nonstop to the designated level.

- (b) The activation of a fire alarm initiating device specified in 2.27.3.2.1(b) or 2.27.3.2.2(b) shall cause all elevators having any equipment located in that machine room, and any associated elevators of a group automatic operation, to be returned nonstop to the designated level. If the machine room is located at the designated level, the elevator(s) shall be returned nonstop to the alternate level.
- (c) In jurisdictions not enforcing NBCC, the activation of a fire alarm initiating device specified in 2.27.3.2.1(c) or in jurisdictions enforcing NBCC, the initiation of a fire detector in the hoistway shall cause all elevators having any equipment in that hoistway, and any associated elevators of a group automatic operation, to be returned nonstop to the designated level, except that initiating device(s) installed at or below the lowest landing of recall shall cause the car to be sent to the upper recall level.
- (d) The Phase I Emergency Recall Operation to the designated level shall conform to 2.27.3.1.6(a) through (n).

2.27.3.2.4 Phase I Emergency Recall Operation to an alternate level (see 1.3) shall conform to the following:

- (a) the activation of a fire alarm initiating device specified in 2.27.3.2.1(a) or 2.27.3.2.2(b) that is located at the designated level, shall cause all elevators serving that level to be recalled to an alternate level, unless Phase I Emergency Recall is in effect
- (b) the requirements of 2.27.3.1.6(f), (j), (m), and (n)
- (c) the requirements of 2.27.3.1.6(a), (b), (c), (d), (e), (g), (h), (i), (k), and (l), except that all references to the “designated level” shall be replaced with “alternate level”

2.27.3.2.5 The recall level shall be determined by the first activated fire alarm initiating device for that group (see 2.27.3.2.1 or 2.27.3.2.2).

If the car(s) is recalled to the designated level by the “FIRE RECALL” switch(es) [see also 2.27.3.1.6(j)], the recall level shall remain the designated level.

2.27.3.2.6 When a fire alarm initiating device in the machine room, control space, control room, or hoistway initiates Phase I Emergency Recall Operation, as required by 2.27.3.2.3 or 2.27.3.2.4, the visual signal [see 2.27.3.1.6(h) and Exhibit S2.1] shall illuminate intermittently only in a car(s) with equipment in that machine room, control space, control room, or hoistway. When activated, a heat detector [2.27.3.2.1(d)] in the machine room, control space, or control room shall cause the visual signal [see 2.27.3.1.6(h) and Exhibit S2.1] to illuminate intermittently only in a car(s) with

equipment in that machine room, control space, or control room.

**2.27.3.3 Phase II Emergency In-Car Operation.** A three-position (“OFF,” “HOLD,” and “ON,” in that order) key-operated switch that will not change position without a deliberate action by the user, shall be labeled “FIRE OPERATION”; provided in an operating panel in each car; and shall be readily accessible. The label “FIRE OPERATION” lettering shall be a minimum of 5 mm (0.25 in.) high in red or a color contrasting with a red background. It shall become effective only when Phase I Emergency Recall Operation is in effect and the car has been returned to the recall level. The switch shall be rotated clockwise to go from “OFF” to “HOLD” to “ON.”

The key shall only be removable in the “OFF” and “HOLD” position. For elevators with power-operated doors, the “OFF,” “HOLD,” and “ON” positions shall not change the mode of operation within Phase II Emergency In-Car Operation until the car is at a landing with the doors in the normal open position, except as required by 2.27.3.3.4 and 2.27.3.4. The three modes of operation within Phase II In-Car Operation (“OFF,” “HOLD,” and “ON”) are specified by 2.27.3.3.1 through 2.27.3.3.4.

For elevators with manual doors, after the car and hoistway doors have been opened at least once at the recall level, the “OFF,” “HOLD,” and “ON” positions shall then change the mode of operation in accordance with 2.27.3.3.1 through 2.27.3.3.4.

2.27.3.3.1 When the “FIRE OPERATION” switch is in the “ON” position, the elevator shall be on Phase II Emergency In-Car Operation, for use by emergency personnel only, and the elevator shall operate as follows:

- (a) The elevator shall be operable only by a person in the car.
- (b) The car shall not respond to landing calls. Directional lanterns, where provided, shall remain inoperative. Car position indicators, where provided, shall remain operative. Landing position indicators, where provided, shall remain inoperative, except at the designated level and the building fire control station, where they shall remain operative.
- (c) Door open and close buttons shall be provided for power-operated doors and located as required by 2.27.3.3.7. Buttons shall be a minimum of 19 mm (0.75 in.) in the smallest dimension. The door open and door close buttons shall be labeled “OPEN” and “CLOSE.” The door open and close buttons shall be operative when the elevator is stopped within an unlocking zone.
- (d) The opening of power-operated doors shall be controlled only by a continuous-pressure door open button. If the button is released prior to the doors reaching the normal open position, the doors shall automatically reclose. Requirements 2.13.3.3, 2.13.3.4, 2.13.4.2.1(b)(2), and 2.13.4.2.1(c) do not apply.
  - On cars with multiple entrances, if more than one entrance can be opened at the same landing, separate door open buttons shall be provided for each entrance.
- (e) Open power-operated doors shall be closed only by continuous pressure on the door close button. If the button is released prior to the doors reaching the fully closed position, horizontally sliding doors shall automatically reopen, and vertically sliding doors shall automatically stop or stop and reopen.
  - On cars with multiple entrances, if more than one entrance can be opened at the same landing, a separate door close button shall be provided for each entrance.
- (f) Opening and closing of power-operated car doors or gates that are opposite manual swing or manual slide hoistway doors shall conform to 2.27.3.3.1(d) and (e).
- (g) All door reopening devices, except the door open button, shall be rendered inoperative. Full-speed closing shall be permitted.
  - Landing door opening and closing buttons, where provided, shall be rendered inoperative.
- (h) Every car shall be provided with a button labeled “CALL CANCEL,” located as required in 2.27.3.3.7, that shall be effective during Phase II Emergency In-Car Operation. When activated, all registered calls shall be canceled and a traveling car shall stop at or before the next available landing. The button shall be a minimum of 19 mm (0.75 in.) in the smallest dimension.
- (i) Floor selection means shall be provided in the car to permit travel to all landings served by the car, and shall be operative at all times, except as in 2.27.3.3.2 and 8.12.1. Means to prevent the operation of the floor selection means or door-operating buttons shall be rendered inoperative. The floor selection means shall be operable without the use of keys, cards, tools, or special knowledge. The floor selection means shall be permitted to be located behind the locked cover specified in 2.27.3.3.7, only if floor selection means for all landings served are included behind the locked cover. Where buttons not accessible to the public are provided they shall be a minimum of 19 mm (0.75 in.) in the smallest dimension.

- (j) A traveling car shall stop at the next available landing for which a car call was registered. When a car stops at a landing, all registered car calls shall be canceled.
- (k) Means used to remove elevators from normal operation shall not prevent Phase II Emergency In-Car Operation, except
  - (1) as specified in this Code
  - (2) as controlled by elevator personnel
- (l) No device, that measures load, shall prevent operation of the elevator at or below the capacity and loading required in 2.16.
- (m) Every car shall be provided with a switch, conforming to the requirements of 2.26.2.33 and located as required in 2.27.3.3.7. When the switch is in the "STOP" position, all registered calls shall be canceled and power shall be removed from the elevator driving-machine motor and brake. When the switch is moved to the "RUN" position from the "STOP" position, the car shall not move, except for leveling, until a call is entered. If the type of switch used is a button, it shall be a minimum of 19 mm (0.75 in.) in the smallest dimension.

NOTE [2.27.3.3.1(m)]: This requirement does not limit the firefighters' stop switch to a specific style of switch. Toggle switches and push/pull buttons are two possible styles. A switch, if provided, should be operable to the "STOP" position by a firefighter wearing protective gloves (see NFPA 1971).

- (n) If the normal power supply, emergency power supply, and standby power supply are not available and the elevator is equipped with an alternate source of power that is insufficient to move the car to all landings, the requirements of 2.27.3.1.6(n)(1) through (5) shall apply.

2.27.3.3.2 For elevators with power-operated doors, when the car is at a landing, with the doors open, and the "FIRE OPERATION" switch is in the "HOLD" position, the car shall remain at the landing with the doors open. The door close buttons shall be inoperative, and car calls shall not be registered.

For elevators with manual doors, when the car is at a landing and the "FIRE OPERATION" switch is in the "HOLD" position, the car shall remain at the landing and car calls shall not be registered.

2.27.3.3.3 When the car is at a landing other than the recall level, with the doors in the normal open position, and the "FIRE OPERATION" switch is in the "OFF" position, power-operated doors shall operate as follows:

- (a) Horizontal sliding doors shall close automatically. All door reopening devices shall remain inoperative. Door open buttons shall remain operative. Full-speed closing is permitted. If the "FIRE OPERATION" switch is turned to the "ON" or "HOLD" position prior to the completion of door closing, the doors shall reopen.
- (b) Elevators having vertically sliding doors shall have corridor "DOOR OPEN" and "DOOR CLOSE" buttons rendered operative. All door reopening devices shall remain inoperative. Door closing shall be in accordance with 2.27.3.3.1(e). Full-speed closing is permitted. If the "FIRE OPERATION" switch is turned to the "ON" or "HOLD" position prior to the completion of door closing, the doors shall reopen.

2.27.3.3.4 When the doors are in the closed position and the "FIRE OPERATION" switch is placed in the "OFF" position, the car shall return to the recall level in conformance with 2.27.3.1.6(a) through (n) and 2.27.3.2.5.

2.27.3.3.5 Elevators shall be removed from Phase II Emergency In-Car Operation only when the "FIRE OPERATION" switch is in the "OFF" position and the car is at the designated level and the doors are in the normal open position.

2.27.3.3.6 The occurrence of an accidental ground or short circuit in elevator electrical equipment located on the landing side of the hoistway enclosure and in associated wiring, as a result of exposure to water, shall not disable Phase II Emergency In-Car Operation once it has been activated.

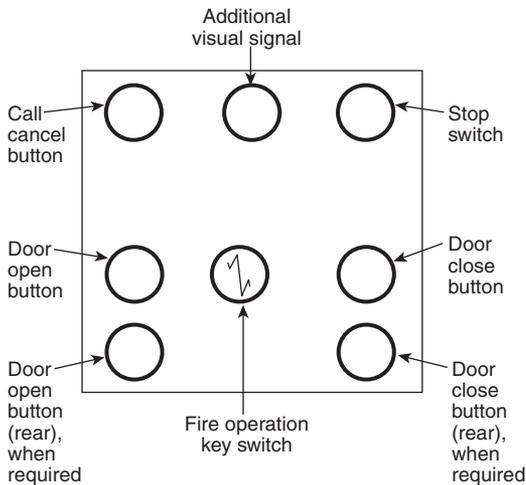
2.27.3.3.7 The "FIRE OPERATION" switch (2.27.3.3), the "CALL CANCEL" button [2.27.3.3.1(h)], the "STOP" switch [2.27.3.3.1(m)], the door open button(s), the door close button(s), the additional visual signal (2.27.3.3.8), and the operating instructions shown in Exhibit S2.4 shall be grouped together at the top of a main car operating panel behind a locked cover.

The firefighters' operation panel cover shall be operable by the same key that operates the "FIRE OPERATION" switch. The cover shall be permitted to open automatically when the car is on Phase I Emergency Recall Operation and at the recall level. When the key is in the "FIRE OPERATION" switch, the cover shall not be capable of being closed. When closed, the cover shall be self-locking.

Where rear doors are provided, buttons for both the front and rear doors shall be provided in the firefighters' operation panel. The door open and door

close buttons for the rear entrance shall be labeled “OPEN REAR” and “CLOSE REAR.”

All buttons and switches shall be readily accessible, located not more than 1 800 mm (72 in.) above the floor and shall be arranged as shown in Exhibit S2.2. Requirement 2.26.12 does not apply to these buttons and switches. The front of the cover shall contain the words “FIREFIGHTERS’ OPERATION” in red letters at least 10 mm (0.4 in.) high.



**GENERAL NOTES:**

- (a) Switches and buttons show only the location not the labeling.
- (b) When manually operated doors are provided, door open and close buttons and instructions for their use are not required.
- (c) Not to scale.

**Exhibit S2.2 Panel Layout.** (From ASME A17.1 Section 2.27, Fig. 2.27.3.3.7)

2.27.3.3.8 An additional visual signal shall be provided and located as required by 2.27.3.3.7. The additional visual signal shall be one of the symbols shown in Exhibit S2.1. The entire circular or square area shown in Exhibit S2.1 shall be illuminated. This additional visual signal shall be activated whenever the visual signal in 2.27.3.1.6(h) is activated.

**2.27.3.4 Interruption of Power.** Upon the resumption of power (normal, emergency, or standby), the car shall be permitted to move to reestablish absolute car position. Restoration of electrical power following a power interruption shall not cause any elevator to be removed from Phase I Emergency Recall Operation or Phase II Emergency In-Car Operation.

The failure and subsequent restoration of electrical power (normal, emergency, or standby) shall not cause any elevator to be removed from Phase I Emergency Operation or Phase II Emergency In-Car Operation.

- (a) Elevators on Phase I Emergency Operation shall be permitted to move only to the next floor in the

direction of the recall level to reestablish absolute car position prior to conforming to 2.27.3.1 and 2.27.3.2.

- (b) Elevators on Phase II Emergency In-Car Operation with the key in the “OFF” position shall be permitted to move only to the next floor in the direction of the recall level to reestablish absolute car position prior to conforming to 2.27.3.3.3 and 2.27.3.3.4. If the key is moved to the “ON” or “HOLD” position before the doors are fully closed, 2.27.3.4(c) or (d) shall apply, and automatic power-operated doors shall open if in a level zone.
- (c) Elevators on Phase II Emergency In-Car Operation with the key in the “HOLD” position shall not move, except for leveling within a leveling zone. Automatic power-operated doors shall open if the doors are not fully closed and the car is in a level zone.
- (d) Elevators on Phase II Emergency In-Car Operation with the key in the “ON” position shall not move, except for leveling within a leveling zone, until a car call is entered. Automatic power-operated doors shall not move until a door open or close button is pressed; after which they shall conform to 2.27.3.3.1(d) and (e). After a car call is entered, the car shall be permitted to move only to the next floor in the direction of the recall level to reestablish absolute car position prior to answering car calls.

**2.27.3.5 Multicompart ment Elevators.** Multicompart ment elevators shall also conform to 2.27.3.5.1 and 2.27.3.5.7.

2.27.3.5.1 The “FIRE RECALL” switch (2.27.3.1) shall be located at the designated level served by the upper compartment.

2.27.3.5.2 The “FIRE OPERATION” switch (see 2.27.3.3) shall be located in the upper compartment.

2.27.3.5.3 A means to display the entire floor area in the lower compartment shall be located in the upper compartment. The means shall display the lower compartment only when Phase I and Phase II is in effect.

2.27.3.5.4 A switch labeled “LOWER CAR LOCK-OUT” with two positions marked “OFF” and “ON” shall be located behind the firefighters’ operation panel cover (see 2.27.3.3.7).

NOTE (2.27.3.5.4): The switch should be operable by a firefighter wearing protective gloves (see NFPA 1971).

- (a) The “LOWER CAR LOCKOUT” switch shall only be functional when Phase II is in effect.
- (b) When placed in the “ON” position, the “LOWER CAR LOCKOUT” switch shall

- (1) disable all door reopening devices in the lower compartment, and
  - (2) initiate closing of the lower compartment doors in accordance with 2.13.4.2.1(c).
- (c) When the car is stopped at a landing and the “LOWER CAR LOCKOUT” switch is in the “OFF” position, the lower compartment doors shall be opened.

#### 2.27.4 Firefighters’ Emergency Operation: Nonautomatic Elevators

Firefighters’ Emergency Operation shall apply to all nonautomatic elevators, except as follows:

- (a) where the hoistway or a portion thereof is not required to be fire-resistive construction (see 2.1.1.1), the rise does not exceed 2 000 mm (80 in.), and the hoistway does not penetrate a floor
- (b) in jurisdictions enforcing the NBCC where the NBCC does not require Firefighters’ Emergency Operation
- (c) where Firefighters’ Emergency Operation is provided voluntarily these requirements shall also apply

**2.27.4.1 Phase I Emergency Recall Operation.** A three-position key-operated switch shall be provided at the designated level for each single elevator or for each group of elevators. The three-position switch shall be labeled “FIRE RECALL” and its positions marked “RESET,” “OFF,” and “ON” (in that order), with the “OFF” position as the center position. The “FIRE RECALL” letters shall be a minimum of 5 mm (0.25 in.) high in red or a color contrasting with a red background. The three-position switch shall be located in the lobby within sight of the elevator or all elevators in that group and shall be readily accessible.

An additional “FIRE RECALL” switch with two positions, “OFF” and “ON” (in that order), shall be permitted only at the building fire control station.

The switch(es) shall be rotated clockwise to go from the “RESET” (designated level switch only), to the “OFF” and to the “ON” positions.

All keys shall be removable only in the “OFF” and “ON” positions.

Only the “FIRE RECALL” switch(es) or fire alarm initiating devices located at floors that are served by the elevator, in the hoistway, or in an elevator machine room, or a control space, or a control room (see 2.27.3.2) shall initiate Phase I Emergency Recall Operation.

All “FIRE RECALL” switches shall be provided with an illuminated visual signal to indicate when Phase I Emergency Recall Operation is in effect.

When all switches are in the “OFF” position, normal elevator service shall be in effect and the fire alarm initiating devices required by 2.27.4.2 shall be operative.

When a “FIRE RECALL” switch is in the “ON” position, a visual and audible signal shall be provided to alert the attendant to return nonstop to the designated or alternate level. The visual signal shall read “FIRE RECALL — RETURN TO \_\_\_\_\_” [insert level to which the car should be returned (the designated or alternate level)]. The signal system shall be activated when Phase I Emergency Recall Operation is in effect.

Where an additional “FIRE RECALL” switch is provided, both “FIRE RECALL” switches must be in the “ON” position to recall the elevator to the designated level if the elevator was recalled to the alternate level.

Where an additional “FIRE RECALL” switch is provided, it shall not affect the visual signal if the designated level fire alarm initiating device (see 2.27.3.2.4) has been activated.

To extinguish the audible and visual signals, the “FIRE RECALL” switch shall be rotated first to the “RESET” and then to the “OFF” position, provided that:

- (a) the additional two-position “FIRE RECALL” switch, where provided, is in the “OFF” position
- (b) no fire alarm initiating device is activated (see also 2.27.3.2.4)

No device, that measures load, shall prevent operation of the elevator at or below the capacity and loading required in 2.16.

**2.27.4.2 Phase I Emergency Recall Operation by Fire Alarm Initiating Devices.** Fire alarm initiating devices shall be installed at each floor served by the elevator, and in the associated machine room, control space, or control room, and elevator hoistway, in compliance with the requirements in NFPA 72 or NBCC, whichever is applicable (see Part 9). In jurisdictions enforcing the NBCC, compliance with 2.27.4.2 is not required where the NBCC specifies manual Emergency Recall operations only.

Phase I Emergency Recall Operation, conforming to 2.27.4.1, shall be initiated when any Phase I Emergency Recall Operation fire alarm initiating device at the elevator lobbies, machine room, control space, control room, or hoistway is activated.

Phase I Emergency Recall Operation, when initiated by a Phase I Emergency Recall Operation fire alarm initiating device, shall be maintained until canceled by moving the “FIRE RECALL” switch to the “RESET” position.

When a fire alarm initiating device in the machine room, control space, control room, or hoistway initiates

Phase I Emergency Recall Operation as required by 2.27.3.2.3 or 2.27.3.2.4, the visual signal [see 2.27.3.1.6(h) and Exhibit S2.1] shall illuminate intermittently only in a car(s) with equipment in that machine room, control space, control room, or hoistway. When activated, a heat detector [2.27.3.2.1(d)] in the machine room, control space, or control room shall cause the visual signal [see 2.27.3.1.6(h) and Exhibit S2.1] to illuminate intermittently only in a car(s) with equipment in that machine room, control space, or control room.

### 2.27.5 Firefighters' Emergency Operation: Automatic Elevators with Designated-Attendant Operation

2.27.5.1 When designated-attendant operation is not in effect, elevators shall conform to 2.27.3.

2.27.5.2 When operated by a designated attendant in the car, except hospital service:

- (a) elevators parked at the recall level shall conform to 2.27.3 without delay; elevators parked at a floor other than the recall level shall conform to 2.27.3.1.6(h). At the completion of a time delay of not less than 10 s and not more than 30 s, elevators parked at a floor away from the recall level shall conform to 2.27.3.
- (b) A moving car shall conform to 2.27.3.

2.27.5.3 When an elevator that is provided with firefighters' emergency operation is on hospital service, a visual signal as shown in Fig. 2.27.3.1.6(h) shall illuminate and a continuous audible signal, audible within the car, shall sound when the "FIRE RECALL" switch(es) (see 2.27.3.1) is in the "ON" position, or when a fire alarm initiating device (see 2.27.3.2) is activated to alert the operator of an emergency. A means located in the car shall be permitted for manually silencing the audible signal, after the signal has been active for at least 5 s. The signal shall be automatically reactivated when the doors open.

The car shall remain under control of the operator until removed from hospital service. An elevator on firefighters' emergency operation shall not be placed on hospital service.

### 2.27.6 Firefighters' Emergency Operation: Inspection Operation

When an elevator that is provided with firefighters' service is on inspection operation (see 2.26.1.4 and 2.26.1.5) or when the hoistway access switch(es) has been enabled [see 2.12.7.3.3(a)], a continuous audible signal, audible at the location where the operation is

activated shall sound when the "FIRE RECALL" switch(es) (see 2.27.3.1) is in the "ON" position or when the fire alarm initiating device (see 2.27.3.2) is activated to alert the operator of an emergency. The car shall remain under the control of the operator until removed from inspection operation or hoistway access operation. Inspection operation or hoistway access operation shall take precedence over Phase I Emergency Recall Operation and Phase II Emergency In-Car Operation.

### 2.27.7 Firefighters' Emergency Operation: Operating Procedures

2.27.7.1 Instructions for operation of elevators under Phase I Emergency Recall Operation shall be incorporated with or adjacent to the "FIRE RECALL" switch at the designated level. The instructions shall include only the wording shown in Exhibit S2.3.

#### FIREFIGHTERS' OPERATION

To recall elevators  
Insert fire key and turn to "ON"

*Exhibit S2.3 Phase I Emergency Recall Operation Instructions. (From ASME A17.1 Section 2.27, Fig. 2.27.7.1)*

2.27.7.2 A sign containing instructions for operation of elevators under Phase II Emergency In-Car Operation shall be incorporated with or adjacent to the switch in each car and shall be visible only when the cover (2.27.3.3.7) is open. The sign shall include only the wording and graphics shown in Exhibit S2.4, except

- (a) for elevators with manually operated doors, the instructions for opening and closing the doors shall be permitted to be replaced with short phrases such as "PUSH DOOR" or "PULL DOOR UP"
- (b) for elevators with vertically sliding doors, the instructions for returning the car to the recall floor shall be permitted to be expanded to include instructions for closing the door

2.27.7.3 Instructions shall be in letters not less than 3 mm (0.125 in.) in height and shall be permanently installed and protected against removal or defacement.

2.27.7.4 In jurisdictions that enforce the NBCC, a symbol showing a red firefighters' hat on a contrasting background, as shown in Exhibit S2.1 (figure not to

<b>FIRE OPERATION</b>	
When	 flashing, exit elevator
To operate car	Insert fire key and turn to "ON." Enter floor selection.
To cancel floor selection	Press "CALL CANCEL" button.
To close door	Press and hold "CLOSE" button.
To open door	Press and hold "OPEN" button.
To hold car at floor	With doors open, turn key to "HOLD."
For emergency stop	Use "STOP" switch.
To automatically return to recall floor	Turn key to "OFF."

**Exhibit S2.4** Phase II Emergency In-Car Operation. (From ASME A17.1 Section 2.27, Fig. 2.27.7.2)

scale), shall be used exclusively to identify elevators that comply with 2.27.3 and additional NBCC requirements. This identification shall be located on the elevator entrance frame or adjacent to it at each emergency recall level. The identification on the entrance frame, or adjacent to it, shall be a minimum of 50 mm (2 in.) in height.

**2.27.8 Switch Keys**

The key switches required by 2.27.2 through 2.27.5 for all elevators in a building shall be operable by the same key. The keys shall be Group 3 Security (see 8.1). There shall be a key for each switch provided.

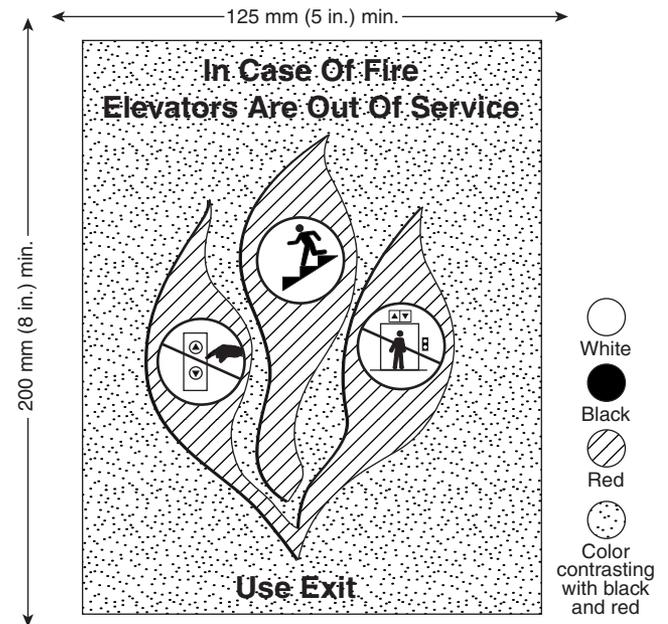
These keys shall be kept on the premises in a location readily accessible to firefighters and emergency personnel, but not where they are available to the public. This key shall be of a tubular, 7 pin, style 137 construction and shall have a bitting code of 6143521. The key shall be coded "FEO-K1." The possession of the "FEO-K1" key shall be limited to elevator personnel, emergency personnel, and elevator equipment manufacturers.

Where provided, a lock box, including its lock and other components, shall conform to the requirements of UL 1037 (see Part 9).

NOTE (2.27.8): Local authorities may specify additional requirements for a uniform keyed lock box and its location to contain the necessary keys.

**2.27.9 Elevator Corridor Call Station Pictograph**

When the building code requires a sign be posted adjacent to hall call fixtures instructing occupants not to use the elevator in case of fire, the sign shown in Exhibit S2.5 shall be provided. The sign shall include only the wording and graphics shown in Exhibit S2.5. When the building code specifies a different design, 2.27.9 shall not apply.



**Exhibit S2.5** Elevator Corridor Call Station Pictograph. (From ASME A17.1 Section 2.27, Fig. 2.27.9)

**EXTRACTS FROM ASME A17.1 HANDBOOK, SECTION 2.27 EMERGENCY OPERATION AND SIGNALING DEVICES\*\***

A note was added in ASME A17.1-2000/CSA B44-00 to recognize that additional requirements may be found in the building codes. For example, IBC requires fire department communication system in high-rise buildings (IBC Section 907.2.12.3).

ASME A17.1a-2002/CSA B44-02 Update No. 1 made major revisions to car emergency signaling requirements. The Code requires a means for all passengers, both able-bodied and disabled, to communicate

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in an emergency. Requirements were prepared to address the following reported concerns:

- (a) reports of passengers being trapped overnight, weekends, and holidays
- (b) alarm bells being ignored
- (c) alarm bells not working
- (d) no one accepting responsibility or accountability for providing assistance
- (e) deficiencies with new technology being utilized at this time
- (f) needs of all elevator passengers

In addition to these requirements, building codes require that all elevators in high-rise buildings (see building code for definition) have a communication system from the elevator lobby, car, machine room, control room, machinery space, and control space outside the hoistway to the building's central control station. See commentary on car lighting in 2.14.7.1.

2.27.1.1.1 In all buildings, a means of two-way communications is required that allows a trapped passenger to call for help and reach someone trained to respond to the call for help. Call routing may be different at different times of the day (for example, normal business hours, versus nights and weekends), but a call for help should always reach a trained person, permitting action to be taken in a timely manner.

2.27.1.1.3(a) Requirements ensure there is no conflict with accessibility requirements (ICC/ANSI A117.1 and ASME A17.1/CSA B44, Appendix E, ADAAG and ADA/ABA AG).

2.27.1.1.3(b) Provides a recognizable means accessible to the passenger to initiate a call for help and establish two-way communications. The term "HELP" describes the passenger's immediate need. Historically the alarm button has always been visible and thus the help button should be visible.

2.27.1.1.3(c) Provides an indication, for hearing-impaired passengers, that the call for help has been received and acknowledged by authorized personnel.

2.27.1.1.3(d) Provides a means for authorized personnel to identify the location of the elevators independent of the passenger having to provide this information.

2.27.1.1.3(e) Provides a means to communicate to the passenger that help is being sent.

2.27.1.1.3(f) The person who receives the call is in the best position to decide how long to continue the conversation. Communications must not cut off after a pre-determined time limit, etc.

2.27.1.1.3(g) Prohibits the use of handsets since they are easily subject to vandalism.

2.27.1.1.3(h) The passenger needs help when a call is placed, not days later when someone listens to voice mail.

2.27.1.1.4 Provides arriving rescuers with the means to communicate with the passenger in high-rise buildings where direct voice communication may not be practical.

2.27.1.1.4(a) Establishes a reasonable time frame in which communications are to be established. Requires the capability for two-way communication with a single car at a time.

2.27.1.1.4(b) See Commentary to 2.27.1.1.3(f).

2.27.1.1.4(c) Provides a visual indication to the passenger that two-way communications is activated.

2.27.1.1.4(d) Provides authorized or "emergency" personnel with operating instructions.

2.27.1.1.5 Provides an alternate power source if normal power fails. The visual signal is part of the emergency communications system and should have the same minimum time standard as the two-way communications means. Duration requirements for the audible signal was changed to 1 hr as it was previously, unintentionally included in the 4 hr requirement.

2.27.1.2 This discourages the use of an emergency stop switch to hold a car at a floor, etc.

## 2.27.2 Emergency or Standby Power System

Emergency or standby power for an elevator is not required by the ASME A17.1/CSA B44 Code. If provided, then it must comply with 2.27.2. Building codes typically require standby power for at least one elevator able to travel to each floor in a high-rise building (see definition of building code in 1.3). This elevator does not have to stop at every floor, but every floor must be served by at least one elevator supplied with standby power. As an example, in a 20-story building elevator group A serves floors 1 through 10 and elevator group B serves floors 1 and 11 through 20. Standby power would have to be supplied to one elevator in group A and one elevator in group B. If the same 20-story building had an elevator that served all floors 1 through 20, then standby power could be supplied to that elevator only.

Building codes in the United States address the need to provide accessible means of egress during a fire. Accessible means of egress include elevators, operating on Phase II Emergency Operation. When ac-

cessible means of egress include elevators, they shall be provided with standby power.

The National Electrical Code (NEC®) has requirements for both legally required standby power systems (Article 701) and optional standby power systems (Article 702). Legally required standby power systems provide electric power when normal power is interrupted to aid fire fighting, rescue operations, control of health hazards, and similar operations. Optional standby power systems provide electric power when normal power is interrupted to eliminate physical discomfort, interruption of an industrial process, damage to equipment, or disruption of business.

Emergency power systems are those essential for safety to human life and must conform to requirements of NEC® Article 700. For additional information, see the NFPA 110 standard for emergency and standby power systems.

Legally required standby power systems have requirements that are very similar to emergency power systems. Upon loss of normal power, the legally required standby power system must be able to supply power within 60 s, whereas emergency power system must be able to supply power within 10 s. Wiring for legally required standby power systems can be installed in the same raceway, cables, or boxes used for other general wiring. In contrast, emergency power system wiring must be entirely independent of all other wiring.

Elevators are normally connected to legally required standby power systems and not emergency power systems. Some hospital elevators are hooked into emergency power systems.

Requirement 2.27.2.1 facilitates availability of power for an elevator system. Power transfer and selection speeds up the evacuation process, minimizes entrapments, and allows use of an elevator by firefighters.

Requirement 2.27.2.4 requires automatic sequence operation. When the switch is left in the AUTO position, each car in turn will move to the recall floor and open their door(s). Automatic sequencing must be arranged that it can be overridden by the manual selection switch. This provides arriving firefighters with ability to select which elevator will receive power. Changing the car selected by the switch must not cause an emergency stop; power will be transferred only after the elevator makes a normal stop at a floor.

See also the commentary on 2.26.10 and Section 620-101 of the National Electrical Code®.

### 2.27.3 Firefighters' Emergency Operations — Automatic Elevators

In 2005, the National Fire Protection Association reported 1,602,000 fires resulting in 3,675 fire deaths in

the United States. There was a civilian fire fatality every 143 min and a civilian fire injury every 29 min. Since 1980, the NFPA has recorded 254 fatal fires in high-rise buildings (over 7 stories) in the United States and Canada. These fires resulted in 3,567 deaths of the public and included 383 firefighters. The last available set of figures showing a comparison between two countries is from 2002. Combined figures covering office buildings, hotels, apartment buildings, and hospitals are 7,300 reported structure fires with 15 civilian deaths, 300 civilian injuries, and \$26 million dollars in direct property damage. If extrapolated to all property uses, these figures suggest a total of 10,200 high rise fires in 2002, civilian deaths of approximately 28, injuries of 350 and direct property damage at \$143 million. The total building fire incidents in the United States were 1,734,500 with 6,196 deaths not including those lost on September 11, 2001 at the World Trade Center attack. In Canada, the comparative figures available for 2001 were 55,300 fire incidents, resulting in 337 deaths. An equally important set of figures is the total number of injuries, in both the United States (21,100) and Canada (1,754). Only through an examination of the data does a true picture of the fire problem that we are facing today emerge. Between both countries, it is estimated that in the past 25 years, there have been thousands of new high-rise buildings built.

The building codes define a high-rise building as a building more than (23 m) 75 ft in height measured from the lowest level of fire department vehicle access to the highest occupiable floor. For a short period after the events of September 11, 2001, there was a period of indecision about the potential future of high-rise construction around the world. All one has to do today is look at the skyline in any major city in North America to recognize the high-rise building boom is back in full swing. In the past, office occupancies had been classified as a low-risk fire hazard. This was true in older, compartmentalized high-rise buildings, with no multi-floor HVAC systems, and office furnishings made of wood or metal. However, the modern high-rise building is different. Fire and smoke spreading to other floors of the structure (i.e., World Trade Center bombings of 2001, 2003 Chicago Cook County Building fire etc.) are the true nightmare facing the firefighting forces of both countries. A factor in this fire problem is the furnishings. The vast majority of today's building interiors use various forms of plastic. Firefighters commonly refer to plastic as frozen gasoline. As plastic is heated from exposure to fire, it goes through a decomposition process that emits toxic, disabling gases (e.g., hydrogen chloride) and flammable hydrocarbon gases, which rapidly spread and cause immediate propagation of the fire across large areas. The smoke

from these products of combustion is dense and black, causing trapped occupants to have little or no visibility, encounter choking smoke, and face heat of temperatures well above what a human being can endure.

Today's high-rise buildings present new and different problems to fire suppression personnel and techniques. The cause of fires in high-rise buildings and the materials used in them, including furniture and fixtures, are not any different from those used in conventional low-rise structures. However, if a fire breaks out in the top story of a high rise, the fire service must transport their firefighters and equipment to the upper floors via elevators operating on Phase II Firefighters' In-Car Operation. In some fires, firefighters had to use stairs to reach the fire floor. Keep in mind that the firefighters, while wearing all of their protective gear weigh an additional 65 lb (29.5 kg). Firefighters also carry long lengths of hose and attachments weighing an additional 50 lb (22.6 kg) to 65 lb (29.5 kg). Using the stairs to gain access to upper floors in a high-rise structure is the last resort. However, firefighters' will use stairs where there is no other choice, as was the case during the World Trade Center attacks on September 11, 2001. After reaching the fire floor, the firefighters will be subjected to high heat [temperatures above 200°F (93°C)]. Their protective clothing will only provide a limited amount of protection, taking into account the "pre-heating" of the gear, depending on the amount of heat exposure, etc. Elevators must be a reliable tool to be utilized by the firefighters in the performance of their duties; however, elevators cannot be relied upon during a fire in a building.

A firefighting commander prefers a fire that is located on the top floor of a building over a fire on a lower floor. Why? Because the life hazard is on the fire floor (top floor), where only the roof and the sky are being exposed. In contrast, a fire on the 10th floor of a 34-story building has a life hazard on all floors above the fire, as well as the fire floor, requiring additional staffing to accomplish the tasks of search, rescue, and fire extinguishment. Recent improvements to the National Fire Incident Reporting System (NFIRS) Version 5.0 now allows the exact floor of fire origin to be indicated, revealing the fact that in high-rise fires reported, the fire floor was on floor 6 or below. Usually the lower floors of any high-rise building will locate the service areas such as maintenance, heating, coffee shops, restaurants, cleaners and other support functions on those floors, with the resulting fires. Many fires do start on higher floors, but the average is floor 6 or below.

Firefighters have immediate concerns relating to smoke and heat spread, stack effect, and uncontrolled

evacuation of building occupants down the same stairways that firefighters are trying to use to move up to locate, surround, and extinguish the fire. A few points to keep in mind: At the Meridian Plaza fire in Philadelphia, there was a total failure of all building systems early in the fire, and secondly, the World Trade Center explosion and resulting fire was below grade, and it took 11 h to complete the evacuation. The events of September 11, 2001 provided terrible reminders of the life hazard that we all must face during a fire in a high-rise building.

Let's review some of the reasons that led to the Code requirements for firefighters' emergency operation. Elevators are unsafe in a fire because:

- (a) person may push a corridor button and have to wait for an elevator that may never respond; valuable time to escape is lost.
- (b) elevators respond to car and corridor calls; one of these may be at the fire floor.
- (c) elevators cannot start until the car and hoistway doors are closed. This could lead to overcrowding of an elevator and the blockage of the doors, and thus prevent closing.
- (d) power failure during a fire can happen at any time and thus lead to passenger entrapment.

Fatal delivery of the elevator to the fire floor can be caused by any of the following:

- (1) an elevator passenger pressing the car button for the fire floor
- (2) one or both of the corridor call buttons may be pushed on the fire floor
- (3) heat may melt or deform the corridor push button or its wiring at the fire floor
- (4) normal functioning of the elevator, such as high or low reversal, may occur at the fire floor
- (5) heat from the fire or loss of air conditioning in the machinery space, machine room, control space, or control room may have a detrimental effect on solid-state control equipment, resulting in erratic elevator operation

The ASME A17.1/CSA B44 Code recognized all of these conditions and has reacted by mandating Phase I Emergency Recall Operation. The building code also requires a sign in elevator lobbies to advise building occupants not to use elevators in a fire. See Handbook Commentary on 2.27.9.

Firefighters' Emergency Operation (FEO) is also known as Firefighters' Service or special emergency service [SES] features. The ASME A17 and CSA B44 Committees have strived to standardize the operation to eliminate variations amongst different elevator equipment that may confuse firefighters' during an

emergency. The automatic or manual return of elevators to the designated level (see 1.3 for definition) is referred to as Phase I Emergency Recall Operation. Phase II Emergency In-Car operation refers to provisions allowing emergency personnel to operate the elevator from within the car.

**2.27.3.1 Phase I Emergency Recall Operation.** ASME A17.1b-1989 through ASME A17.1b-1992 required Phase I for an elevator with a rise of 7.62 m (25 ft) or more. Under earlier editions of the Code, an elevator could have nearly 15.24 m (50 ft) of rise [just less than 7.62 m (25 ft) above and below the designated landing], and still not have been required to have Phase I and Phase II operation. The term “designated level” (see 1.3) refers to the main floor or other level that best serves the needs of emergency personnel for firefighting and rescue purposes. The term “alternate landing” (see 1.3) refers to a floor level identified by the building code or fire authority, other than the designated landing. The term “recall level” (see 1.3) refers to the designated or alternate level that the car returns to when Phase I Emergency Recall Operation is activated. These requirements apply for all automatic elevators except when the hoistway or a portion thereof is not required to be constructed of fire-resistive construction (2.1.1.1), the rise does not exceed 2 000 mm or 80 in., and the hoistway does not penetrate a floor. An example of this would be an elevator that only traveled from one level in a lobby to a second level in the same lobby and not penetrating a fire barrier. This arrangement can be seen in department stores or malls.

A three-position key-operated switch must be provided in the designated level lobby for each single elevator or for a group of elevators. The location of the three-position Phase I Emergency Recall switch has been standardized so that the switch will be located where all of the elevators are within sight and readily accessible. The key is to be removable only in the “ON” and “OFF” positions. The specified key positions standardize around a clockwise rotation to reach the “ON” position similar to the requirements for the Phase II Emergency In-Car Operation switch. Prior to the ASME A17.1-2000/CSA B44-00, the three-position Phase I key switch included the “BYPASS” position in jurisdictions not enforcing NBCC. Bypass allowed building or emergency personnel to return elevators to normal service without clearing an activated (alarmed) fire alarm initiating device (e.g., smoke detector). However, the entire automatic Phase I Emergency Recall system would be disabled when the key was in the “BYPASS” position. The fire alarm initiating devices that are used today are far superior to the ones

that were first used. Today’s systems can be monitored, maintained, and cleared from their control panel.

Beginning with ASME A17.1-1996, the expertise of NFPA 72 was recognized as the proper authority to determine the number, type, and location of fire alarm initiating devices in a building. In continuing with this transition, in ASME A17.1-2000/CSA B44-00 the “BYPASS” position was replaced with the “RESET” position on the three-position Phase I Emergency Recall Operation switch. The “RESET” feature will be utilized by emergency personnel (1.3) to reset the elevators returning them to normal service, after Phase I Emergency Recall Operation has been activated. If the fire alarm initiating device has not been cleared before using the “RESET” feature, then the Phase I Emergency Recall Operation will continue in effect until the device has been replaced, repaired, or bypassed by the fire alarm system. The Phase I switch shall be labeled “FIRE RECALL” and its positions marked as “RESET,” “OFF,” and “ON” (in that order), with the “OFF” position as the center position. An additional key-operated “FIRE RECALL” switch, with two positions, marked “OFF” and “ON” (in that order), is permitted only at the building fire control station. Keys shall be removable in the “OFF” and “ON” positions only. The switches cannot be spring loaded.

During Phase I operation the elevator is not available to the general public as automatic elevator use may be hazardous during a fire emergency. When an elevator is out of service during a fire, the public is unable to use it as a means of exiting from the building. Depending on the building fire plan, occupants will be directed to either the stairwells, places of refuge, or to be active participants in the emergency plan developed for their safety by the building owners/operators.

Earlier editions of the ASME A17.1/CSA B44 Code addressed only automatic door operations. The 1981 and later editions of the Code cover operation of vertically sliding doors, doors controlled by constant pressure buttons, and manual doors. The only time an automatic elevator will not return upon activation of Phase I is when that car is at a landing with its door(s) open and the in-car stop switch, emergency stop switch (in-car, top-of-car, pit, etc.), or some other electrical protective device is activated.

Requirement 2.27.3.1.6(b) recognizes that an elevator at a landing with the in-car stop switch or emergency stop switch in the “STOP” position should not be recalled, as this is not a normal condition. The stop switch may have been activated to facilitate an inspection or maintenance and recalling the elevator could be a hazard to elevator personnel. Once the car moves,

the in-car stop switch is disabled, just like the emergency stop switch, and the elevator cannot be stopped using the switch. This feature prevents a person (such as building cleaning personnel) with access to the in-car stop switch key from activating the in-car stop switch, after the doors are closed and the elevators is being recalled. This would create an unsafe condition, as the firefighters would have to search for the car immediately. Moreover, the occupant may be putting himself or herself in great danger.

For passenger safety, 2.27.3.1.6(e) requires elevators doors to close at a slower speed when a door-reopening device is rendered inoperative. Mechanically actuated door-reopening devices are not sensitive to smoke or flame and can remain operative. Flame is the glowing, gaseous, visible part of a fire. Smoke or flame can register a signal, whereas a direct flame fire will destroy. Unless the fire was inside the car, the cars would all have responded to the recall level well in advance of fire directly impinging on the hoistway door reversal device. The reference to 2.13.5 recognizes “nudging” and, therefore, it is not unsafe to disconnect mechanically actuated door-reopening devices.

Requirements 2.27.3.1.6(f) and (g) allow full control of those doors that may have to be closed from the corridor. Also, the automatic closing of vertical slide doors requires an active “OPEN” or “STOP” button on the corridor. An active corridor “DOOR OPEN” button allows the user to open a closed hoistway door to access a car with a manual gate that is in an open position. A firefighter may need the “DOOR OPEN” button to open the door to see if anyone is in the car.

Operating hall position indicators [2.27.3.1.6(f)] may convey a message that the elevators may be used. Only where elevator location is important to firefighters, such as the designated level and the building fire control station, may hall position indicators remain in operation. Car position indicators are always required by the firefighters utilizing the elevators, thus these devices are to remain operative.

As the car will not be called to the fire floor, and the recall level elevator landing is free of smoke, it is safe to keep the doors open. Arriving firefighting forces will be able to immediately determine if all cars have answered the recall, and passengers are not trapped in cars within the hoistway. If the Incident Commander (IC) of the firefighting forces cannot account for and verify where the elevators are, then firefighters will have to be diverted from other critical duties of rescue and suppression to search for and establish control over those elevators and their occupants.

The visible and audible signals [2.27.3.1.6(h)] alert passengers in an automatically operated elevator of the emergency and can minimize any apprehension

that the passengers may have while the elevator is returning to the main floor. In an attendant-operated elevator, this signal alerts the attendant of the emergency and signals them to return immediately to the designated level. When on inspection operation, the inspector or maintenance personnel are also alerted to the emergency by this signal.

Requirement 2.27.3.1.6(j) recognized that if the smoke detector at the designated level is activated, turning only the additional Phase I switch to the “ON” position will not override the fire alarm initiating device sending the car to the alternate level. Where an additional “FIRE RECALL” switch is provided, both “FIRE RECALL” switches must be in the “ON” position to recall the elevator to the designated level if the elevator was recalled to the alternate level (2.27.3.2.4). This is because the additional switch may be at a location where the condition of the designated level lobby cannot be determined. This also prevents a melted Phase I switch from recalling the cars from the alternate to the designated level.

To remove the elevators from Phase I, the “FIRE RECALL” switch shall first be rotated to the “RESET” position, and then to the “OFF” position. If a second recall switch is provided, it must be in the “OFF” position to remove the elevator from Phase I Emergency Recall Operation. Means used to remove elevators from normal operation, other than as specified in this code, shall not prevent Phase I Emergency Recall Operation. This requirement gives firefighters priority over elevator use by service personnel, movers, security lock out, etc. This feature was included at the request of the fire service community, who often arrived at a fire, only to find that most of the elevators were not accessible for their use.

On the other hand, changes in the ASME A17.1/CSA B44-2007 Code recognize that cars shut down for safety reasons in accordance with other code requirements (such as an earthquake or flood) should not respond to Firefighters’ Emergency Operation. The ASME A17.1/CSA B44-2007 edition also recognizes the existence of battery operated devices used to move an elevator during a power failure. Without knowing where the fire is, these devices can move the elevator to let the passengers out as soon as possible, while the fire is still in its early stages, so they can exit the building.

**2.27.3.2 Phase I Emergency Recall Operation by Fire Alarm Initiations Device.** An initiation device is defined by NFPA 72 as a system component that originates transmission of a change-of-state condition, such as in a smoke detector, etc.

2.27.3.2.1 The reference to the National Fire Alarm Code®, NFPA 72 is to a standard with expertise to spec-

ify the type and installation of automatic initiating devices. NFPA 72 has been revised, at the request of the ASME A17 Committee, to address fire alarm systems in all building types. Members of the National Fire Alarm Code®, NFPA 72 Committee have the expertise to determine when fire conditions require automatic elevator recall. See Chart 2.27.3.2.1(a) for excerpts from the NFPA Fire Alarm Code® Handbook. Beginning with ASME A17.1b-1997 a fire alarm initiating device must be provided at all floors. ASME A17.1 recognizes that devices other than smoke detectors may be more appropriate under some conditions. Those conditions are specified within NFPA 72. See Chart 2.27.3.2.1(b).

*Editor's Note: Please refer to the ASME A17.1 Handbook for Charts 2.27.3.2.1(a) and (b).*

2.27.3.2.2 To harmonize with the requirements in NBCC the term "smoke detector" substitutes for "fire-alarm initiating device" and "elevator lobby" for elevator landing."

2.27.3.2.4 The following is the basis for alternate floor recall. It is not preordained that the designated level has the lowest fuel load of any other floor in the buildings. This may be the case in some major, high-rise office buildings, but it certainly is not applicable to many other buildings, such as apartments, hotels, showrooms, or buildings with elaborate reception areas. However, even if it were a fact, a firebomb can suddenly provide an enormous fuel load on an otherwise fire-resistant floor.

Most of buildings have elevators without an express zone. In buildings with express zones, it is safer to park elevators away from any potential fire floor. It is feared that if the mandatory alternate floor requirement is repealed and made permissive, then many buildings would revert to the early Code requirements requiring return to the designated level. This would be a step backwards in protecting the riding public from arriving at a fire floor.

When elevators are returned to an alternate level, firefighters have not lost control. If conditions dictate that the designated level is safe, firefighters can call the elevators to the designated level by turning the required three-position keyed switch to the "ON" position. The key switch overrides alternate floor recall operation and returns all elevators to the designated level, even though the elevators may be parked at a floor above an express zone. ASME A17.1a-2005/CSA B44-04 Update 1-05 made a change so that once this happens, the designated level remains the recall level, even if the key switch is reset.

Typically, the designated level is also the location of the central command station. It would be difficult to

effectively utilize a designated level central command station if the designated level is engulfed in a rapidly spreading fire such as the one that destroyed the main floor of the MGM Hotel. Elevators that are returned to, or parked at, the main floor are of no value if the result is loss of life.

While sprinklers will reduce the probability of a large fire, smoke in dangerous quantities may be produced. Sprinkler manufacturers argue for the effectiveness of sprinklers in stopping fire in a large number of buildings, but as smoke control advocates note, it is smoke, and not the flames themselves cause the majority of fire deaths. Smoke control advocates believe that sprinklers allow too much smoke to develop before sprinklers activate.

Use of smoke detectors for the recall function has also been questioned because of the possibility that smoke may be present on floors above and/or below the fire floor. The Code has addressed this in 2.27.3.2.5 by indicating that the first smoke detector activation determines the recall level (see 1.3). It is highly improbable that smoke detectors on floors other than the fire floor would activate beforehand.

As a corollary to smoke detectors required to initiate elevator recall, others argue that the water flow switch associated with the on-floor sprinkler system is more positive. Smoke detectors can initiate elevator recall when the smoke reaches the elevators and threatens passengers; but smoke or water flow in a remote part of the building should not trigger a recall.

2.27.3.2.5 This requirement states that the elevator only needs to respond to the first detector, activated. The likelihood of two simultaneous fires is infinitesimal. It is assumed that the smoke detector at the fire floor will be the first one that is activated. Subsequent alarms would most likely occur due to smoke migration and would not affect the choice of the recall floor. Revisions made in ASME A17.1a-2005/CSA B44-04 Update 1-05 clarified the cars should never move to the alternate floor after being recalled to the designated level.

Connecting smoke detectors to the elevator system appropriately positions the elevators while the fire department is still on the way. This feature prevents building occupants from being delivered to a fire floor, and permits the firefighters to quickly assess if all elevators have been recalled. Detectors at the designated level prevent the passengers from being delivered to a fire at that floor. The detectors no longer serve a purpose once the passengers are out and the firefighters have arrived. The detectors are still useful for tracking smoke spread at the fire alarm panel. Once the firefighters decide it is safe to return the cars to the

designated level there is no reason to return the cars to the alternate again.

**2.27.3.3 Phase II Emergency In-Car Operation.** Beginning with the 1981 edition of ASME A17.1, Phase II operation is required whenever Phase I operation is provided. Previously the requirement was predicated on the needs of emergency personnel. The current requirement takes into account the need by firefighters during an emergency including evacuating the disabled. Disabled persons are always a concern, but the term “handicapped” in the normal context is not applicable. In a fire, even a firefighter can be considered disabled, especially when near exhaustion or if his/her compressed air supply is gone. Further, able-bodied occupants can become disabled from smoke, from walking up or down steps, or from shock. Therefore, when you hear that provisions must be made for the disabled during a fire, expand your overall picture, because even normal ambulatory persons can suddenly become nonambulatory.

Phase II firefighters’ operation is for firefighters. Some of the input received from firefighters is as follows:

Firefighters need the elevator for their use. The Fire Services have long complained of elevators not being available to them upon arrival at the fire building. Elevators operating on Phase II are “firefighters’ tools” and firefighters want the maximum number of elevators available. Firefighters will take command during a fire, and they will determine whether and how many elevators are to be used. Firefighters are willing to accept the risks that are associated with running elevators during a fire. It is standard operating procedure for the firefighters to use the elevators not only to carry equipment for firefighting or evacuation purposes, but to also disperse fire personnel to non-fire-involved floors. The presence of a firefighter reduces occupant fears, and firefighters can direct occupant movement strategy since they are in constant communication with the fire command post.

Many firefighters stated that there are times when they cannot afford the luxury of using personnel to operate an elevator on a return trip to the main floor. They requested placing the Phase II switch in the elevator to the “OFF” position to automatically cause the elevator to return to the main floor for use by later arriving firefighters. However, Standard Operating Guidelines (SOG) dictate that whenever staffing does permit, a firefighter with a radio should be dedicated as the “taxi” operator of any car being placed onto Phase II operation. That firefighter would be responsible for the shuttling of firefighters and their equipment

to the discharge floor, usually a minimum of two stories below the fire floor. This would be their task until relieved by another firefighter assigned that position. There also is a requirement that when the car is on Phase II operation, turning the switch in the car to the “HOLD” position at a floor will permit the firefighter to remove the key, and leave the car without the danger of an unauthorized person taking the car to another floor.

The ASME A17 Code Committee was aware of the need to evacuate the disabled during a fire. ASME A17.1a-1992 and later editions require firefighters’ service on all elevators. Building codes, Life Safety Code (NFPA 101), American with Disabilities Act Accessibility Guidelines (ADAAG), and Americans with Disabilities Act/Architectural Barriers Act Accessibility Guidelines (ADA/ABA AG) envision the use of elevators operating on Phase II as a principal means of evacuating the disabled during a fire. Phase II is a major step forward by providing firefighters with the necessary tools to accomplish this task. However, the elevator industry must continue its research and development into making the elevator reliable for evacuation during a fire. Firefighters need access to all floors that the elevator serves, so security systems, etc. must be overridden. ASME A17.1/CSA B44-2007 recognized that modern elevators do not always have traditional car call buttons, provided they give firefighters access without causing unnecessary delay and/or confusion.

ASME A17.1-2004/CSA B44-04 incorporated a number of new requirements. The FIRE OPERATION switch (2.27.3.3), the CALL CANCEL button [2.27.3.3.1(h)], the stop switch [2.27.3.3.1(m)], the door open button(s), the door close button(s), the additional visual signal (2.27.3.3.8), and the operating instructions shown in Exhibit S2.4 are required to be grouped together at the top of a main car operating panel behind a locked cover. This panel came about for a number of reasons. To eliminate confusion, firefighters wanted all of the components that they would be using in one area.

A STOP SWITCH, which will be accessible only to the firefighters is required in the fire operation panel. The firefighter operation panel cover must be operable by the same key that operates the FIRE OPERATION switch. The cover shall be permitted to open automatically when the car is on Phase I Emergency Recall Operation and at the recall level. When closed, the cover shall be self-locking. Where rear doors are provided, buttons for both the front and rear doors are required to be provided in the firefighters’ operation panel. The door open and close buttons for the rear entrance must be labeled “OPEN REAR” and “CLOSE REAR.”

All buttons and switches must be readily accessible, located not more than 1 800 mm or 72 in. above the floor and shall be arranged as shown in Exhibit S2.2. Requirement 2.26.12 does not apply to these buttons and switches. These controls are not required to comply with ADAAG, ADA/ABA AG, ICC/ANSI A117.1 or ASME A17/CSA B44 Appendix E, thus the ASME A17.1/CSA B44 Code specifies minimum sizes to ensure that a firefighter wearing gloves can operate them. The front of the cover must contain the words "FIREFIGHTERS OPERATION" in red letters at least 10 mm or 0.4 in. high.

The key-operated switch is called the "FIRE OPERATION" switch, labeled "OFF," "HOLD," and "ON," in that order. It shall be rotated clockwise, to go from "OFF" to "HOLD" to "ON." Removable only in the "OFF" and "HOLD" position, it shall not change the mode of operation within Phase II Emergency In-Car Operation until the car is at a landing with its doors in the normal open position. By preventing the key from being removed from the fire operation switch, when in the "ON" position, reduces the potential of leaving a car stranded after a fire emergency. It also reduces the possibility of unauthorized personnel entering an empty car, and taking it to another floor, as it is unlikely a firefighter would not remove their fire operations key when exiting a car.

As requested, firefighters may reverse the elevator direction at the next available landing by turning Phase II switch to "OFF" (2.27.3.3.4). The car shall remain on Phase II operation, and, without going through a door open and close sequence, will return to the designated level. This provides the firefighter with a means of aborting an upward flight when conditions warrant their return to the designated level options.

Means used to remove elevators from normal operation, other than as specified in this Code, shall not prevent Phase II Emergency In-Car Operation. Appropriate requirements for cars with more than one entrance are established [2.27.3.3.1(d)]. Requirement 2.27.3.3.1(e) recognizes that reopening large vertically sliding doors with continuous pressure closing is impractical and may introduce a delay factor impeding safety. Requirement 2.27.3.3.1(g) recognizes that door-reopening devices are not necessary since constant pressure operation is required.

At the request of firefighters, 2.27.3.3.2 was revised in ASME A17.1/CSA B44-2007 to address elevators with power operated or manually operated doors.

For standardization, 2.27.3.3.3 and 2.27.3.3.4 define Phase II operation in the "OFF" position and the car is not at the recall level, so that turning the key "OFF" returns the car to the floor where the firefighter started.

Requirement 2.27.3.3.4 was revised in ASME A17.1/CSA B44-2007 to clarify elevator operation when the Phase II switch is placed in the "OFF" position. If Phase I had been activated by the fire alarm initiating device at the designated lever, the car will return to the alternate level unless it was overridden by the Phase I switch.

2.27.3.3.6 Water from automatic sprinklers and/or fire department hose streams may cause an accidental ground or short circuit in elevator electrical equipment that is located on the landing side of the hoistway enclosure. Equipment such as hall lanterns and corridor call buttons must not shut down a car operating on Phase II.

**2.27.3.4 Interruption of Power.** This requirement clarifies that during power interruption, Phase I or Phase II must remain in effect upon restoration of power. The elevator must be designed to recover from the power failure without further endangering the firefighters or other passengers. Firefighters normally use elevators to move between the recall floor and a staging floor typically two floors below the fire. Firefighters typically do not move the elevator past the fire floor. If the elevator control system needs to move the car to re-establish its position, movement should only occur when the firefighters are ready, and not take the car past the fire floor.

**2.27.3.5 Multicompartment Elevators.** Prior to ASME A17.1/CSA B44-2007, designers developed operational steps for double-deck elevators on Phase II. This led to some complex processes that differed from building to building. To provide consistency for firefighters, the code defines a method allowing a firefighter in the upper deck to verify that lower deck is vacant and to control the doors on the lower deck. To respect the privacy of passengers in nonemergency situations the viewing means is disabled during normal operation.

#### 2.27.4 Firefighters' Emergency Operation — Nonautomatic Elevators

This requirement establishes the operation requirements of elevators, which are not covered by 2.27.3. A standard sign alerts the operator as to which floor the elevator should be returned to. See Handbook commentary on 2.27.3.

#### 2.27.5 Firefighters' Emergency Operation — Automatic Elevators With Designated Attendant Operation

A "designated attendant" (see 1.3) is where the elevator is controlled solely by authorized personnel (see

1.3) such as attendant service, independent service, hospital service, and similar operations.

A car could be left at the fire floor, exposing the hoistway to fire, when it could be recalled. The delay gives ample warning prior to recall. ASME A17.1/CSA B44-2007 eliminated the time delay if the car was parked at the recall level, since an arriving firefighter could ride the car up into the building thinking that the elevator was operating on Phase II, and then be put in danger when the doors open automatically.

“Hospital Service” (see 1.3) is a special case of operation by a designated attendant (see 1.3) used only for medical emergencies. Hospital service elevators, are used for transporting critical patients — not food or laundry. Bringing a patient to the lobby instead of an operating room, etc. could be life threatening. Firefighters can use another elevator until the car is released from hospital service. The code beginning with ASME A17.1a-2005/CSA B44-04 Update 1-05 allows the operator to temporarily silence the audible signal, since noise may inhibit patient care.

#### 2.27.6 Firefighters’ Emergency Operation — Inspection Operation

This requirement recognizes that taking the elevator control away from elevator personnel may be hazardous. This requirement provides for notification of an emergency in the building.

#### 2.27.7 Firefighters’ Emergency Operation — Operating Procedures

Operating procedures must be incorporated with or be adjacent to the Phase I and Phase II key-operated switches. This assures that, during an emergency, emergency personnel have quick access to the procedures. Since firefighters’ service is now standardized, the Code specifies signs with simple and clear wording that explain the operation of the elevators. Signs must not deviate from the required text in ASME

A17.1/CSA B44. However, the requirement allows the instructions to be modified for manual doors. An explanation of the “RESET” position is not necessary on the Phase I sign because this is a building function, not a firefighters’ operation.

Requirement 2.27.7.4 recognizes a requirement in NBCC.

#### 2.27.8 Switch Keys

ASME A17.1/CSA B44-2007 incorporated a requirement for a single specific key coded “FEO-K1” to be used on all elevators to eliminate the confusion and delay that occurs when hunting for keys during a response to an emergency. Some jurisdictions may adopt their own standard key while accomplishing the same goal. The distribution of the uniform key should be controlled through laws and training.

The required switch keys for Phase I and Phase II operation must be the same to assure a speedy response to the emergency situation. To allow for simultaneous operation of all key switches a key is required for all Phase I and Phase II key switches.

A Note is included to suggest that local jurisdictions may legislate uniform keyed lock box requirements to assure the availability of emergency keys when building personnel are not available. It is not within the jurisdiction of ASME A17.1/CSA B44 to mandate a uniform keyed lock box.

#### 2.27.9 Elevator Car Call Station Pictograph

If the building code requires a sign, but does not specify its appearance, then the sign in ASME A17.1/CSA B44 Exhibit S2.5 must be used. Previously, designers were free to provide any sign, resulting in inconsistency and possible confusion. ASME A17.1/CSA B44-2007 clarifies that the figure background may be the base material of the sign, but that the circles must be filled in with white.