



## California State Fire Marshal **CODE INTERPRETATION**

Date Issued	8-17-07	Interpretation	06-128
Topic	Elevator Power Shut-Trip & Recall		
Code Section(s)	CBC (2001) 403.2.1, 403.4, 905.1, 3003.2 ANSI/ASME A17.1 (1996) NFPA 72 (1999 & 2002 Editions)		
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A number of issues with regard to life safety for occupants within elevators have recently arisen. There appear to be conflicting requirements within the California regulations and, more importantly, contradictory opinions from the enforcement officials as to how to apply them. It is my informed layman's understanding of California statutes that the Office of the CSFM has supremacy in matters involving fire and panic within buildings under its jurisdiction and that DOSH is subservient to this jurisdiction. The following set of questions is submitted in order to officially clarify the CSFM position on these issues of fire and life safety in high-rise buildings:

- 1. Does CCR Title 24 Part 2 Section 403.4 apply to all portions of a high-rise building, such as and including the elevator cabs and hoistways?**

*Yes, California Building Code (2001) Section 403.4, in conjunction with Section 905.1, requires that a smoke control system be provided for all occupiable portions of a high-rise building, including elevator cabs (capable of transporting people) and their associated hoistways.*

- 2. Does CCR Title 24 Part 2 Section 905.1 require that the smoke control design provide a tenable environment for the evacuation or relocation of occupants within an elevator car and hoistway?**

*Yes. The California Building Code (2001), Section 403.4, in conjunction with Section 905.1, requires that a smoke control system be provided in high-rise buildings in order to provide a tenable environment for the evacuation or relocation of all occupants, which would include elevator cars capable of transporting people and their associated hoistways.*

*Note: CBC, Section 905.13.2 requires that the elevator shaft fans where installed and the vent dampers required by Section 3004 be monitored by and have control capability from the firefighters smoke control panel.*

- 3. Does CCR Title 24 Part 2 Section 403.2.1 require the installation of sprinklers within elevator machine rooms and control rooms of high-rise buildings?**

Yes.

- 4. Does CCR Title 24 Part 2 Section 3003.2 intend for the recall to be completed before the automatic disconnection of main electrical power to the elevator, as required by Rule 102.2(c)(3) of ANSI/ASME A17.1-1996 through CCR Title 24 Part 7 Section 7-3120.2(n), is accomplished?**

*Neither the California Building Code (CBC), Section 3003.2 nor ASME A17.1 specifically require that the elevator recall be completed (return car to the designated floor) prior to elevator power shunt-trip. The CBC, ASME 17.1 and NFPA 72 (1999 & 2002) only require that recall of the elevators shall occur upon smoke detection at the associated elevator lobbies, hoistways and elevator machine rooms. The CBC and ASME A17.1 only require that the elevator power to be automatically disconnected prior to fire sprinkler water flow inside elevator machine rooms or elevator hoistways.*

*However, both the current editions of NFPA 72, National Fire Alarm Code (2002, Section A.6.15.4.4 and 2007, Section A.6.16.4.4), recommend that: “upon activation of the heat detector used for elevator power shutdown, there should be a delay of the activation of the elevator power shunt trip”, and that “this delay should be the time it takes the elevator cab to travel from the top of the hoistway to the lowest recall level”.*

*The CBC, ASME A17.1 and NFPA 72 do not prohibit the required heat detectors located in the elevator machine rooms and hoistways installed for shunting of elevator power from also initiating elevator recall. ASME A17.1 only specifies*

*that: “fire alarm initiating devices used to initiate Phase I Emergency Recall Operation shall be installed in conformance with the requirements of NFPA 72”. In addition, NFPA 72 allows other initiating devices to initiate elevator recall where required by the authority having jurisdiction.*

*Without completing the recall to the designated floor or alternate floor, the elevator car is prone to “suddenly stop dead” wherever it may be in the hoistway upon activation of the elevator power shunt-trip. This life safety dilemma is amplified in high-rise buildings, where most occupants may not be aware of a fire on another floor until they are inside the elevator car. Most elevators will continue to function normally above and below the fire floor until recalled by a smoke detector located at the fire floor elevator lobby, hoistway or machine room, or through manual intervention.*

*Therefore, allowing elevators to complete the required recall to the designated safe floor level prior to elevator power shunt-trip makes good fire and life safety sense and is recommended, since once the elevator power shunt-trip is activated, it can not be over-ridden and will cause the elevators to immediately stop. The affected elevators are rendered inoperable even for firefighters, and worse yet, has the potential to trap the rescue personnel inside the elevator shafts.*

**5. Does the following configuration of devices and sequence of operations comply with the purpose and intent of the foregoing sections?**

- a. Upon receiving and verifying an alarm signal from any elevator machine control unit space spot-type, photoelectric smoke detector, the *UL Standard* complying and listed fire alarm system control unit shall:
  - i. Initiate immediate Phase I recall of the elevators served from the elevator machine control space in alarm as required by AVSI / ASME A17.1-1996, Rule 211.3b;
  - ii. Initiate a timing sequence of sufficient duration to fully accomplish the Phase I recall for all cars from their most remote location, plus an additional 60 seconds in order to accommodate an elevator on independent service. The timing sequence is to be resident within the fire alarm control units program and, upon completion, will enable a verified alarm signal transmission from any elevator machine control unit space heat detector to automatically disconnect main elevator power and release the dry pipe valve. No smoke detector will be capable of initiating either the automatic disconnection of main elevator power and or the release the dry pipe valve.

b. Upon receiving and verifying an alarm signal from any of the elevator machine room intermediate temperature heat detectors, the *UL Standard 864* complying and listed fire alarm system control unit shall:

i. In the event the above smoke detectors have not already caused such, initiate Phase I recall; and

ii. Initiate a timing sequence of sufficient duration to fully accomplish the Phase I recall for all cars from their most remote location, plus an additional 60 seconds in order to accommodate an elevator on independent service. The timing sequence is to be resident within the fire alarm control unit's program.

iii. Upon completion of the timing period programmed into the *UL Standard 864* complying and listed fire alarm system control unit, automatically disconnect the electrical power to the elevator machines and controllers as prescribed by ASMEA 17.1, Rule 102.2 (e) (3); and

iv. Upon automatic disconnection of the main power, release the dry-pipe, double interlock, pre-action sprinkler system valve serving the elevator machine control space in alarm.

(Water flow would remain dependent upon the fusing of one or more high temperature thermal links of the standard response sprinklers in the elevator machine control space. These sprinkler links would be one temperature classification higher than the installed fixed-temperature heat detectors.

The final setting of the timing period would be dependent on the actual maximum time required for capture and return in Phase 1 Recall for each bank of elevators. This would be determined in the field when the elevators are fully available for a timed test.)

*Yes, the configuration of devices and sequence of operations as stated above would comply with the intent of the current California Building Code, California Fire Code, NFPA 72 (1999 & 2002) ) and ANSI A17.*

**6. If the foregoing configuration of devices and sequence of operations is acceptable, would the purpose and intent of the provisions of NFPA 13 -1999, Section 5-13.6, and NFPA 72-1999, Section 3-9.3. 3-9.3.9A, be met by the utilization in elevator machine rooms and control rooms of standard response, high-temperature-rated sprinklers (located and spaced as required for Ordinary Group I Hazard) along with smoke detectors and intermediate temperature rated spot-type heat detectors (located and spaced per the ordinary and customary requirements of NFPA 72 found in Sections 2-2.2, 2-2.4 and 2-3.4) when using the described configuration of devices and sequence of operations?**

Yes.