

LA FIRE SPRINKLER ASSOCIATION QUARTERLY MEETING  
APRIL 16, 2002  
SFM ITEMS OF CONCERN

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ITEM 1. WATER TIE-IN AT ADJACENT ISOLATED HAZARDS: 101:9.7.1.2, 101:8.4.1.1

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NFPA 101:9.7.1.2 – isolated hazards allows up to 6 heads to be protected by domestic water, complete with control valve. “Isolated” refers to separate room with door. Isolated hazard refers to any room that contains a degree of hazard greater than that normal to the general occupancy of the building, per NFPA 101:8.4.1.1. If a non-sprinklered building has 6 heads in an isolated hazard room and the room has a combustible interstitial space above the ceiling, sprinkler protection is not required in the interstitial space. The intent of the code is to provide sprinkler protection in the room containing the hazard, not the ceiling cavity above it. However, hazard protection may be provided by sprinklers or 1-hour fire barriers, or both. The fire barrier walls are required to extend through the ceiling cavity to the floor or roof deck above, or it can terminate at a 1-hour fire rated ceiling.

Taking guidance from the handbook commentary to NFPA 101:9.7.1.2, two isolated hazard rooms on the same floor or different floors, whether adjacent to each other or not, can tie into domestic water at a single point, provided:

- ✍ each room meets the definition of isolated hazard and
- ✍ the sprinkler protection for each room does not exceed the limits of Section 9.7.1.2.

Therefore, tie-in to domestic water can occur at single point at domestic water supply, when feeding two adjacent isolated hazards. However, a control valve is required for each isolated hazard room, regardless of number of heads, in accordance with NFPA 101:9.7.1.2.

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ITEM 2. CONSISTENCY OF SAME RESPONSE HEADS WITHIN COMPARTMENTED SPACE: 13:5-3.1.5.2

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13:5-3.1.5.2 states when existing light hazard systems are converted to use quick response or residential sprinklers, all sprinklers in a compartmented space shall be changed. Commentary adds: The mixing of QR with standard response sprinklers in a space can cause more sprinklers to operate than necessary and change the order in which sprinklers operate – sprinklers further away from the fire could operate first. The intent of the code is that a compartmented space is a single room, not an entire building smoke compartment.

If an existing nursing home is adding new bathrooms in each sleeping room (no separate bathrooms existed prior) then new bathrooms are new spaces that require QR heads. Existing sleeping rooms can remain with ordinary response heads, provided QR heads are not being added to existing room. Ordinary heads in sleeping rooms can be repositioned and/or additional ordinary response heads can be added to existing rooms containing ordinary response heads. Once QR heads are introduced to an existing room with ordinary response heads, 13:5-3.1.5.2 requires all heads to be changed to QR. A combination of QR and ordinary response heads in the same room is not acceptable.

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ITEM 3. SPRINKLER PROTECTION OF ELEVATOR PITS: 13:4-13.5.1, ANSI A17.1: 102.2 (c), 101:2.1.1

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NFPA 13:4-13.5.1, 1996 Edition (13:5-13.6.1, 1999 Edition) requires sprinklers in elevator pits. We do not find any language that talks about control valves for these sprinklers.

ANSI A17.1, the Elevator Code, paragraph 102.2 covers hoistways, machine rooms, and machinery spaces with subparagraph 102.2 (c) stating "Standard sprinkler protection conforming to the requirements of ANSI/NFPA 13 may be installed in these spaces subject to the following.

- 1) All risers and returns shall be located outside those spaces.
- 2) Branch lines in the hoistway shall supply sprinklers at not more than one floor level.

- 3) Means shall be provided to automatically disconnect the main line power supply to the affected elevator prior to the application of water. This means shall not be self-resetting. The activation of sprinklers outside of the hoistway or machine room shall not disconnect the main line power supply.
- 4) Smoke detectors shall not be used to activate sprinklers in these spaces or to disconnect the main line power supply.

The June 18, 1993 letter from your office on interpretation of the elevator code, ANSI A17.1, paragraph 102.2(c) requires compliance with this paragraph for hoistways, machine rooms, and machinery spaces. It does not specifically mention elevator hoistway pits.

ANSI A17.1 paragraph 102.2 does not specifically mention elevator hoistway pits. Requirements for pits are contained in A17.1, paragraph 106. There is no mention of sprinkler coverage in this paragraph.

Inquiry 93-50 Subject Sprinkler in Pit Rule 102.2 to the ANSI A17.1 Committee asks: "May a sprinkler be installed in the pit of an elevator without a means to disconnect power to this elevator prior to the application of water? The Committee's response was 'No'." This was approved on December 8, 1993. Therefore, it appears that Rule 102.2 also applies to hoistway pits.

Based on the above, a means to disconnect power to the elevator cars within the affected hoistway must be provided before the application of water. Because of this, we would also interpret your June 18, 1993 letter also applies to elevator hoistway pits.

A past method to control water was by using a solenoid valve in the branch line to the sprinkler in the pit. The solenoid valve would open admitting water to the sprinkler in the elevator pit only after the elevator was moved to the recall position and the elevator car was disconnected from electrical power. This method is no longer allowed because valves used in fire protection systems must be listed for fire protection use and there are no solenoid valves on the market with this listing.

We would propose, therefore, that one of the means to disconnect power to the elevator prior to the application of water would be by installing a low temperature (135 (F) thermal detector within 2 feet of the sprinkler in the pit and install a high temperature (286 (F) sprinkler in the pit. The action of this installation would be the same as the situation within the elevator machine rooms. The thermal detector would put the fire alarm system in alarm. The fire alarm programming would move the elevators to their recall positions, and then electrical power would be disconnected to the elevators. This should occur prior to the fusing of the link (or breakage of the bulb) in the high temperature sprinkler. Therefore, there would be no valves in the branch piping serving the sprinkler within the elevator pit, and we can find no requirement to do so.

SFM response:

This office currently enforces NFPA 13, 1999 edition. NFPA 13:Chapter 13 and NFPA 101:2.1.1 reference ASME A17.1, 1993 edition.

ASME A17.1 defines hoistway as "an opening through a building or structure for the travel of elevators, dumbwaiters, or material lifts, extending from the pit floor to the roof or floor above." Therefore, the pit is acknowledged as part of the hoistway.

You are correct, regarding the requirement that the sprinkler head in the pit must be an integral part of the delayed waterflow subsequent to elevator recall.

Coincidentally, the 1997 amendments to ASME A17.1, 1996 edition provides an exception to the lower 2 feet of the hoistway. Rule 102.2(c)(3) states:

Means shall be provided to automatically disconnect the main line power supply to the affected elevator prior to the application of water from sprinklers located in the machine room or in the hoistway more than 2 feet above the pit floor. This means shall be independent of the elevator control and shall not be self-resetting. The activation of sprinklers outside of the hoistway or machine room shall not disconnect the main line power supply.

However, we can only consider the 1997 amendments of A17.1 on an appeal basis, at this time. The June 18, 1993 Formal Interpretation still applies. We also published a March 22, 1999 addition to the June 18, 1993 Formal Interpretation, and is attached for your use.



## ELEVATOR POWER SHUT OFF AND SPRINKLER OPERATION

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### ITEM 4. POLICY REGARDING CALCULATION SUBMITTAL WITH SPRINKLER EXEMPTION PACKAGE: SPRINKLER EXEMPTION FORM INSTRUCTIONS

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Sprinkler exemption instructions: the intent of Item 5 of the instructions applies ONLY to domestic tie-in for unsprinklered buildings. If a sprinklered building project scope is limited to 2 heads in one janitors closet, this office will not deny it based on the 5.D. requirement for sketch and calculation. In a fully sprinklered building, we allow up to 6 new heads in a room without sketch and calculation.

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### ITEM 5. SUPERVISION OF SPRINKLER SYSTEM CONTROL VALVES: 101:9.7.2.1, 13:5-14.1.1.3, 72:3-8.6.5, 72:3-8.3.3.1.2

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Each occupancy chapter in NFPA 101 designates the requirement for a sprinkler system. If the occupancy chapter requires a supervised automatic sprinkler system then compliance with NFPA 101:9.7.2.1 is required. The definition of "supervised" sprinkler system differs between NFPA 101 and NFPA 13. NFPA 13:5-14.1.1.3, 1999 edition, requires sprinkler control valves to be either physically locked in the open position or electrically supervised. However, NFPA 101:9.7.2.1 states that "Where supervised automatic sprinkler systems are required by another section of this Code, supervisory attachments shall be installed and monitored for integrity in accordance with NFPA 72. Monitoring shall include, but not be limited to, monitoring of control valves, fire pump power supplies and running conditions, water tank levels and temperatures, tank pressure, and air pressure on dry pipe valves." The term supervised automatic sprinkler system, where indicated below, shall apply to the requirements of NFPA 101:9.7.2.1, when a supervised system is required by another section of NFPA 101.

NFPA 72:3-8.6.5, 1996 edition, requires control valves in a supervised automatic sprinkler system to furnish a signal to the fire alarm panel when the valve is moved from normal (open) position.

NFPA 72:3-8.3.3.1.2, 1999 edition, requires the fire alarm system to supervise conditions that are essential for the operation of a supervised automatic sprinkler system. NFPA 72:A-3-8.3.3.1.2 includes control valves as part of the essential operation.

The handbook commentary to NFPA 72:3-8.3.3.1.2 states that this paragraph of NFPA 72 requires electrical supervision by the fire alarm system for all supervised automatic sprinkler system control valves, even if the valves are physically locked. Therefore, NFPA 72 is more stringent and control valve tamper switches are required for every control valve in a supervised automatic sprinkler system, including backflow preventer control valves.

If NFPA 101 does not require a supervised automatic sprinkler system, then NFPA 101:9.7.2.1 does not apply and "supervision" of the sprinkler system control valves defaults to the requirements of NFPA 13:5-14.1.1.3. In this case, either a tamper switch or locking the valve open is acceptable.

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### ITEM 6. LISTING REQUIREMENTS FOR INDICATING VALVES: 13:3-8.1.1, 13:3-8.1.1 Exception No. 3, 25:Table 7-3.1 and 7-3.7.1

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13:3-8.1.1 Valves controlling water supplies to sprinklers shall be listed indicating valves for fire protection applications.

3-1.1 Backflow special check valve devices are not "listed" for fire protection use - they are only "classified". Please refer to the UL description under section "Backflow Special Check Valve Devices (BAEU)", within the UL Fire Protection Equipment Directory.

Exception No. 3, NFPA 25:Table 7-3.1 and 7-3.7.1 A nonindicating valve, such as an underground gate valve with roadway box, is acceptable but shall be verified weekly by building owner's trained personnel. T-wrench shall be inserted over valve control nut to verify valve is in fully open position.

### ITEM 7.

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ITEM 7. BUILDINGS FOUR STORIES AND LESS REGARDING UTILIZATION OF NFPA 13R: 101:30.3.5.1

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NFPA 101:30.3.5.1 that, "buildings up to and including four stories in height, NFPA 13R is permitted". Even though 13R is titled Sprinkler Systems In Residential Occupancies Up To And Including Four Stories In Height, the commentary defers the definition and applicability of building stories to NFPA 101 and the building codes. NFPA 101 specifically denotes "buildings" - so that makes it clear. Therefore, a 5-story building cannot utilize a 13R system.

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ITEM 8. SPRINKLER PROTECTION AT ELEVATOR SHAFTS

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Is it the intent of 5-13.6.1 (Exception) to require sprinkler protection at the bottom of an elevator shaft (regardless if the elevator is hydraulic or not) if the shaft is constructed of fire rated gyp board? Previously, gyp board (sheet rock) was considered by the NFPA 13 committee as noncombustible, see Formal Interpretation 4-4.4.1, dated Oct.-Nov. 1976.

Present code terminology classifies gyp board as limited combustible not noncombustible.

Is it the intent of 5-13.6.3 (Exception) to require sprinkler protection at the top of an elevator shaft if the shaft is constructed of fire rated gyp board, for passenger elevators meeting ASME A17.1?

If NFPA 13 classifies a fire rated gyp board enclosure as limited combustible, not noncombustible, then what is the required sprinkler protection for a (typical) stairway constructed of a limited combustible (fire rated gyp board) stair shaft with noncombustible stairs? 5-13.3 does not specifically define sprinkler protection requirements for noncombustible stairs within anything other than noncombustible shafts.

SFM response:

The 1999 edition of NFPA 13:A-5-13.6.3 states that materials exposed to the interior of the car and the hoistway, in their end-use composition, are limited to a flame spread of 0 to 75 and a smoke development of 0 to 450. Fire rated gypsum board meets this criteria. It has been an acceptable policy of this office to acknowledge exposed fire rated gypsum board as meeting the intent allowed in NFPA 13:5-13.6.3 Exception and

This office has traditionally utilized the intent of NFPA 13:A-5-13.6.3 (1999 edition), which states that materials exposed to the interior of the elevator car and the hoistway, in their end-use composition, are limited to a flame spread rating of 0 to 75 and a smoke development of 0 to 450 are exempt from sprinkler protection at the top of the hoistway. Fire rated gypsum board meets these requirements and can apply to NFPA 13:5-13.6.3 Exception and NFPA 13:5-13.3.2.

Question:

I'm still not sure how to treat stairways with fire rated gypsum board enclosure (and noncombustible stairs). NFPA published an Official Interpretation in November 1976 dealing with this issue. The interpretation states, "In sprinklered buildings, elevator shafts, which are totally enclosed and of fire resistive or protected noncombustible construction, need not be sprinklered". Therefore this office acknowledges fire resistive construction as meeting the intent of NFPA 13:5-13.3.2, the 1999 edition. Are sprinklers required at every floor landing? No, only at the top of the shaft and under the first landing above the bottom of the shaft, in accordance with NFPA 13:5-13.3.2, if the shaft is fire resistive. In other words, if the gypsum board assembly appears in the UL Fire Resistance Directory, then this office acknowledges the assembly as fire resistive. The fire resistance rating (1-hour, 2-hours, etc.) must comply with applicable portions of NFPA 101.

NFPA 13:5-13.3.2 addresses noncombustible shafts and this office utilizes the above Official Interpretation to give guidance on acknowledging fire resistive construction similar to noncombustible construction, with respect to sprinkler protection of stair and elevator shafts. Also, NFPA 13:5-13.2 does not seem to address accessible shafts with a limited combustible enclosure. If a utility shaft is accessible but is constructed of fire resistive construction and the openings are protected per code, then we utilize the Official Interpretation to acknowledge them the same as noncombustible, nonaccessible shafts.

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ITEM 9. MIXED 13 & 13R DESIGN: 101: 4-1.12

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Does the office have a policy as to how these "hybrid" systems must be reviewed, in lieu of code recognition? There does not seem to have been issued any memorandum on the subject. Would this type of thing, if accepted, be an application of 13: 1-2 and or 101: 1-6? In the past some have been addressed by letter from the owner / P.O.R. to Jerry Jones, and

replied with handwritten notes on the correspondence. It appears that the policy now, such as for designs to newer than currently enforced editions of the standard, is to require a formal appeal.

SFM response:

NFPA 13 does not specifically allow mixed, or hybrid, 13 & 13R designs. The provisions included in 13 for dwelling units and the use of residential sprinklers implies that NFPA 13 intends that where dwelling units occur within a building protected by a NFPA 13 system, the standard should apply to the entire building. NFPA 101: 4-1.12, Mixed Occupancies, requires that where two or more classes of occupancy occur within the same building, intermingled, without separate safeguards (per handbook commentary: "separate building" compartmentation, with separate means of egress). . . other safeguards shall comply with the most restrictive life safety requirements . . .

The sprinkler submittals rarely provide sufficient information for the reviewer to infer construction / compartmentation / separate safeguards and also, in themselves, do not represent construction documents for other than the sprinkler system.

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ITEM 10. SPRINKLER DISCHARGE OBSTRUCTIONS AT UNOBSTRUCTED CONSTRUCTION: 13:Figure A-5-5.5.1, 13:A-1-4.6 (f), 13:5-13.1.1, 13:Table 5-6.2.2 (a),

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NFPA 13:Figure A-5-5.5.1 is not specifically applicable to wood truss construction. NFPA 13:A-1-4.6 (f) classifies wood truss construction as unobstructed. NFPA 13:5-13.1.1 requires all concealed spaces enclosed wholly or partly by exposed combustible construction to be protected by sprinklers. NFPA 13:5-6.4.1.1 requires sprinklers to be located within 1 to 12 inches of the ceiling. There are no restrictions to the vertical distance between sprinkler and ceiling below, when considering protection of a floor/ceiling cavity. Exception No. 1 to NFPA 13:5-13.1.1 exempts sprinkler protection of concealed spaces formed by studs or joists with less than 6 inches between the inside or near edges of the studs or joists. Thus, it is the intent of NFPA 13:5-13.1.1 Exception No. 1 that sprinkler protection shall be provided in combustible concealed spaces with a clear height distance of greater than 6 inches between joists. There are no requirements to provide closer sprinkler spacing than that required at NFPA 13:Table 5-6.2.2 (a).

NFPA 13:5-6.5.2 and NFPA 13:Figure A-5-5.5.1 are intended to define the area of sprinkler discharge that is affected by adjacent obstructions, when sprinkler protection is on one side of the obstruction only. When sprinkler protection is on opposite sides of an obstruction, these code references do not apply. Formal Interpretation 76-11, page 262 of the NFPA 13 Handbook confirms this issue. As illustrated in the formal interpretation, with sprinklers on both sides of the beam drop, Table 5-6.5.1.2 is not applicable. Therefore, the sprinkler layout of the ceiling cavity at the referenced facility is not dependent on the location of the trusses, provided the wood trusses comply with the definition at NFPA 13:A-1-4.6 (f).

Also, see NFPA 13:Figure 5-6.4.1.4 and 5-3.1.1 Exception No. 1 (similar situations to above). Look at the sketch. If you turn the top joists so they are running parallel with the roof slope it does not change the intent to be allowed to omit sprinklers in areas with clearance of less than 6 inches. This occurs frequently in protected combustible attics. We cannot require protection in the eaves space of an attic if it meets the 6 inch exemption rule.

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ITEM 11. NEW DENSITY REQUIREMENTS FOR 13D AND 13R SPRINKLERS

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New UL requirements for NFPA 13D and 13R heads – density from .040 to minimum .050. See Reliable Website.

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ITEM 12. "GO-TO-WORK" LETTER HARDSHIP

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This office will consider a "go-to-work" letter provided the POR fax the request and include the time hardship.

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ITEM 13. ROOM DESIGN METHOD COMMUNICATION: 13:7-2.3.3

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Do not take for granted that we automatically assume room design method when no information is instructed and no fire barriers are noted.