

**Code Technology Committee
2010 Final Action Agenda
Review of NIST WTC Recommendations**

The following are code changes and public comments to be considered at the 2010 Dallas Final Action Hearings that are related to the CTC Area of Study noted above.

E1 – Page 1
E131 – Page 2
G41 – Page 4
G44- Page 6
G46 – Page 11
G48 - Page 13
G49 – Page 15
G159 – Page 17

G160 – Page 18
G165 – Page 19
G169 – Page 20
G171 – Page 21
G173 – Page 22
F27 – Page 23
F29 – Page 30

E1-09/10

1001.4 (New) (IFC [B] 1001.4 (New))

Proposed Change as Submitted

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC)

Add new text as follows:

1001.4 Fire safety and evacuation plans: Fire safety and evacuation plans shall be provided for all occupancies and buildings where required by the *International Fire Code*. Such fire safety and evacuation plans shall comply with the applicable provisions of Sections 401.2 and 404 of the *International Fire Code*.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html>. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Review of NIST WTC Recommendations". The scope of the activity is noted as:

Review the recommendations issued by NIST in its report entitled "Final Report on the Collapse of the World Trade Center Towers", issued September 2005, for applicability to the building environment as regulated by the I-Codes. To evaluate the necessity of developing code changes in response to the NIST report.

This proposal is similar to E3-07/08 last cycle. However, based on fire service input, it has been expanded to include the reference to Section 401.2 of the IFC, which states:

401.2 Approval. Where required by this code, fire safety plans, emergency procedures and employee training programs shall be approved by the fire code official.

This added reference identifies the scope of responsibility of the evaluation of the plans.

The purpose of this code change proposal is to provide consistent requirements for jurisdictions regarding requirements for fire safety and evacuation plans. We feel fire safety and evacuation plans are important issues that impact occupant egress during an emergency and therefore meets the intent of the IBC and needs to be addressed. In addition, many jurisdictions across the country currently have adopted the IBC, however many of these same jurisdictions have not adopted the IFC. This reference will ensure that at least the fire safety and evacuation plans of the IFC are adopted by reference. Enforcement of the provisions is not an issue based on the reference to Section 401.2. The provisions are clearly within the scope of the IFC.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME:Heilstedt-E2-1001.4

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal would provide uniformity throughout the codes. This will assure that all means of egress issues in the IFC and IBC are addressed before the certificate of occupancies is issued. This will assist the fire department when they perform means of egress maintenance reviews.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

George Kellogg, Rocklin, CA, representing Sacramento Valley Association of Building Officials, requests Disapproval.

Commenter's Reason: Fire Safety and Evacuation plans are documents that require annual maintenance and are required to include a number of provisions not a part of the building codes. Minor changes in building use or changes in business procedures can trigger a modification to the Fire Safety and Evacuation Plan that would not trigger a building permit. Additionally, building department personnel typically are only trained to apply Chapter 10 means of egress requirements and do not have the training or expertise to evaluate all of the other important aspects of an adequate Fire Safety and Evacuation Plan—putting the review of the plan in the building code would in fact create the false impression that building department approval of plans would indicate that the required Fire Safety and Evacuation Plan is completely adequate and correct. This is clearly within the purview of the Fire official. While there needs to be communication between Building and Fire officials for new construction activity, there is no need for revised fire and evacuation plans required by the Fire Code to be reviewed by the Building official. As stated by the proponent, this proposal is essentially the same as E3-07/08 (that was overturned and soundly defeated by code officials at the Final Action Hearings in Minnesota) excepting the addition of a reference to section 401.2 of the IFC. As also stated by the proponent, this added code reference was intended to clarify the enforcement responsibility for the Fire Safety and evacuation plan. However it appears to add a new level of confusion. IFC section 401.2 states: "Approval. Where required by this code," [the IFC or IBC?] "fire safety and evacuation plans, emergency procedures, and employee training programs shall be approved by the fire code official." Clearly, IBC section 1001.4 is the enforcement responsibility of the Building Code official. Will this change now require the Building official to be responsible for the fire official's actions???

This change adds confusion for enforcement authority and responsibility, and does not improve the IBC or the IFC. Current IFC code contains all of the provisions necessary for requiring and enforcing Fire Safety and Evacuation plans and clearly requires enforcement authority and responsibility with the Fire Code official. No changes to either code are necessary to provide the level of egress safety and planning provided by the Fire Safety and Evacuation Plan.

Public Comment 2:

John E. Rosenquist, representing United Conveyor Corporation, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

1001.4 Fire safety and evacuation plans: Fire safety and evacuation plans shall be provided for all occupancies and buildings where required by the *International Fire Code*. Such fire safety and evacuation plans shall comply with the applicable provisions of Sections 401.2 and 404 of the *International Fire Code*. All industrial occupancies shall comply with OSHA 2008, CFR 29, part 1910 Subpart E, and to the requirements of NFPA 101, Chapter 40, Industrial Occupancies.

Add new standard to Chapter 35 as follows:

Occupational Safety and Health Administration

OSHA 2008, CFR 29, part 1910. Occupational Safety and Health Standards, Subpart E, Means of Egress

Commenter's Reason: Industrial facilities are designed to conform to the safety and egress requirements of OSHA 2008, CFR 29, part 1910 Subpart E, and to the requirements of NFPA 101, Chapter 40, Industrial Occupancies.

The IBC Building Code cannot override the requirements of Federal work place safety and egress rules. It would be better if IBC referenced NFPA 101 for all egress requirements as does OSHA. NFPA 101 encompasses everything covered by IBC with far more clarity and breadth of scope.

Analysis: The standard, OSHA 2008, CFR 29, was not reviewed or considered by the IBC Code Development committee and it was not considered by the hearing attendees at the time of the code development hearings. Section 3.6.3.1 of Council Policy #28, *Code Development*, requires that new standards be introduced in the original code change proposal, therefore, the introduction of a new standard via a public comment is not in accordance with the process required by CP# 28 for adding new standards to the code.

Final Action: AS AM AMPC____ D

E131-09/10

1024.4 (IFC [B] 1024.4)

Proposed Change as Submitted

Proponent: Lee C. DeVito, PE, FIREPRO Incorporated, representing self

Revise as follows:

1024.4 (IFC [B] 1024.4) ~~Self-luminous and photoluminescent~~ Luminescent materials. Luminous egress path markings shall be permitted to be made of any material, including paint, ~~provided that an electrical charge is not~~

required to maintain the required luminance. Such materials shall include, but are not limited to, self-luminous materials and photoluminescent materials and electroluminescent materials. Materials shall comply with either:

1. UL 1994; or
2. ASTM E 2072, except that the charging source shall be 1 foot-candle (11 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 30 millicandelas per square meter at 10 minutes and 5 millicandelas per square meter after 90 minutes.

Reason: Electrical systems provide the building management with more flexibility with the operation of the exit path marking systems. Electrical systems do not need backup lighting which will allow building managers to control lighting. Furthermore, energy savings and Green/LEEDS requirements (for example thru the use of motion sensor lighting) may be further achieved with electroluminescent materials, as separate, continuously operational light sources are not required for charging purposes. A later section of this code, 1024.5 Illumination, requires means of egress illumination for photoluminescent exit path markings is required for at least 60 minutes prior to periods when the building is occupied. Electroluminescent exit path markings would not require this.

Electrical systems can be operated at any time as they have available power and they are protected with battery standby support. Therefore, the building management can utilize the electrical systems whenever there is an alarm activity or other situation in the building, whether the building power is available or not. Self luminous and photoluminescent materials only provide lighting when the background lighting is limited.

Electrical systems are supervised so the building management will know that there is a problem. Self-luminous materials and photoluminescent materials are not supervised, so they can be damaged or removed and no one is notified until a manual check is performed on the system. Whereas the systems are required in some high-rise buildings manual inspection will be time consuming and possibly burdensome, which may mean that self luminous or photoluminescent systems may not be inspected.

The building management can utilize the flexibility of electrical systems to provide further information on the availability or disruption of an egress path.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME:Devito-E1-1024.4

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: While this new technology will allow greater flexibility, this proposal is not clear on electrical backup and supervision requirements. There is still the issue of maintenance of the battery system. Would 'loss of power' be loss of power to the building or loss of emergency power?

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Lee C. DeVito, PE, FIREPRO Incorporated, representing self, requests Approval as Modified by this Public Comment.

Modify proposal as follows:

1024.4 (IFC [B] 1024.4) Luminescent materials. Luminescent exit path markings shall be permitted to be made of any material, including paint,. Such materials shall include, but not limit to, self-luminous materials, and photoluminescent materials ~~and electroluminescent materials or electrical devices such as electroluminescent or LED strips~~. Materials shall comply with either:

Self-luminous and photoluminescent materials –

1. UL 1994, or
2. ASTM E 2072, except that the charging source shall be 1fc (10 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 5 millicandelas per square meter after 90 minutes.

Electrical devices –

1. UL 1994, and
2. The system shall have a backup emergency power supply that consists of a dedicated battery source that provides backup power for a minimum of 90 minutes and it is listed to UL 924.
3. The electrical devices shall illuminate within ten seconds in the event of a power failure in the area where the devices are located. The devices shall remain illuminated for 90 minutes following the loss of power.
4. The electrical system shall be supervised and provide a supervisory signal to the building fire alarm panel.

Commenter's Reason: The original proposal was rejected, but with the request that additional information be provided. The individual that provided a public objection also indicated an item of concern. I have addressed each of those concerns, which primarily addressed the battery backup requirements for the electrical systems.

G41-09/10
403.2.4, Table 403.2.4

Proposed Change as Submitted

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC) and Lawrence G. Perry, AIA, representing Building Owners and Managers Association (BOMA) International

Delete without substitution as follows:

~~**403.2.4 Sprayed fire resistive materials (SFRM).** The bond strength of the SFRM installed throughout the building shall be in accordance with Table 403.2.4.~~

TABLE 403.2.4
MINIMUM BOND STRENGTH

HEIGHT OF BUILDING^a	SFRM MINIMUM BOND STRENGTH
Up to 420 feet	430 psf
Greater than 420 feet	1,000 psf

For SI: 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kW/m²

a. Above the lowest level of fire department vehicle access

Reason: Heilstedt - The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html>. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public

This proposed change is a result of the CTC's investigation of the area of study entitled "Review of NIST WTC Recommendations". The scope of the activity is noted as:

Review the recommendations issued by NIST in its report entitled "Final Report on the Collapse of the World Trade Center Towers", issued September 2005, for applicability to the building environment as regulated by the I-Codes. To evaluate the necessity of developing code changes in response to the NIST report.

The current provisions for minimum bond strength were added to the code via G68-06/97. The following is the committees reason for inclusion:

Committee Reason: Although the data which provides technical support was not provided within the proposal, this does go along with the NIST recommendations and should provide better safety in high-rise buildings. Using the greater bond strengths will increase the probability that the protection will stay in place and will reduce the likelihood of being dislodged. These factors should provide for a longer time of safety. Placing the requirements in the high-rise provisions of Chapter 4 instead of within Chapter 7 makes sense because they are only applicable to high-rises and will be more likely to be found within that section. The committee did agree with the different bond strength requirements based upon the thought the taller buildings are at a higher risk and that items such as the vibration of tall buildings will affect the long term performance. Based on testimony which was provided, the cost impact of this requirement was considered as being relatively small. The higher density products which are currently available will generally meet these requirements. The modifications included a revision of the terminology "spray applied" to "sprayed" to be consistent with the action of FS156-06/07 and to create a more global point of reference for building height by moving footnote a to the main title of the first column.

In submitting a public comment to G69-07/08 last cycle to remove the minimum and retain the 150 psf in Chapter 17, CTC noted that the current provisions for minimum bond strength were the results of G68-06/07 last cycle. As noted in the reason statement for the code change, it notes "The purpose of this proposal is to increase the required adhesions of Spray Applied Fire Resistant Materials (SFRM)." The proposal further sites Recommendation 6 of the NIST WTC report which calls for improvement of the in-place performance of SFRM. NIST Recommendation 6 reads as follows:

NIST recommends the development of criteria, test methods, and standards: (1) for the in-service performance of sprayed fire-resistive materials (SFRM, also commonly referred to as fireproofing or insulation) used to protect structural components; and (2) to ensure that these materials, as-installed, conform to conditions in tests used to establish the fire resistance rating of components, assemblies, and systems.

The CTC notes that the prior to the approval of the increased bond strength in Table 403.15 that the code mandated cohesive/adhesive bond strength, regardless of height, was 150 psf in Section 1704.10.5. In fact, this section has remained unchanged and was not coordinated with the new provisions in Table 403.15.

Based on input received by the CTC, the CTC position remains that the bond strength should not be increased as a function of height. As noted in the NIST recommendation, the concern is one of in-service performance of the SFRM which means the material must remain in place to perform its intended function, regardless of height. This is an inspection related issue, one for which the CTC submitted code change S39-06/07 to improve the inspection provisions, including:

- Increased number of sampling locations
- Specific sampling for columns, beams, joists and trusses
- Physical and visual tests for: substrates; thickness; density, bond strength

S39-06/07 was approved and the provisions will be incorporated in the 2009 edition of the IBC.

There is no credible technical evidence or documented experience to indicate that the increased minimum bond strength requirements specified in the subject text and Table improve the long term durability of sprayed fire –resistive materials (SFRM) in high-rise buildings or improve the chances of SFRM to be in place when it is needed (in the event of a fire). The single proven effect of these increased bond provisions is to dramatically increase the SFRM installed cost by up to 250%. SFRM minimum bond strength of 150 psf (Section 1704.12.6), in conjunction with inspections and field tests, specified in Section 1704.12, are adequate to ensure SFRM is in place after completion of the construction phase. Regular inspections and timely repairs are needed to ensure SFRM in-place condition over the life of the building, regardless of the bond strength of SFRM.

A survey of the commercially available SFRM products in terms of their bond strength and density, conducted by the American Iron and Steel Institute (AISI) in 2007 clearly indicates that the provisions in Section 403.2.4 and Table 403.2.4 are specifically calibrated and targeted to ban standard-density SFRM products from the high-rise market – i.e., these provisions create an artificial commercial barrier, but do not address any measurable risks or safety concerns tied to any meaningful bond strength values (in terms of SFRM in-place durability).

The current provisions in Section 403.2.4 and Table 403.2.4 resulted from proposal G68-06/07 (and further slightly modified by proposal G68-07/08), based on misleading technical information and flawed cost impact analysis provided in the proposal and relevant testimonies during the public hearings:

- G68-06/07 reason statement suggested “building sway” as a “known” “initiating event” for SFRM dislodgement. Testimony during the public hearings also suggested building vibration as a possible cause for SFRM dislodgement. To date, no evidence has been found to document either of these claims.
- G68-06/07 reason statement noted that “The purpose of this proposal is to increase the required adhesions of Spray Applied Fire Resistant Materials (SFRM)”, seeking to achieve the improvements called for in Recommendation 6 of NIST WTC Report. Testimonies during the hearings further suggested that proposal G68-06/07 is somehow based on NIST WTC Investigation and its recommendations. In fact, NIST Recommendation 6 reads as follows:
“NIST recommends the development of criteria, test methods, and standards: (1) for the in-service performance of sprayed fire-resistive materials (SFRM, also commonly referred to as fireproofing insulation) used to protect structural components; and (2) to ensure that these materials, as-installed, conform to conditions in tests used to establish the fire resistance rating of components, assemblies, and systems.”

There is nothing in Recommendation 6, or in any other part of the NIST WTC Investigation Report, to justify the immediate need to arbitrarily increase the SFRM bond strength. Nothing in the published NIST report suggested that the SFRM bond strength was inadequate for any of the intended purposes. The compiled records actually indicated that WTC towers endured numerous fires prior to 9/11 with minimal or no structural damage. Nothing in the NIST Report suggested that any existing SFRM product with higher bond strength and/or higher density would have performed better, or would have changed the sequence or the outcome of events.

- G68-06/07 proposal noted that “Many tall buildings already utilize these higher strength materials”. However, in 2006, there was only one high-rise building known to utilize medium-density SFRM throughout the building (the reconstructed WTC 7), and the owner did it for understandable reasons. In fact, the absence of long-term nation-wide experience with the “throughout” application of medium-density and high-density SFRM in high-rise buildings should be a cause for concern – due to the lack of long term data to support their use.
- G68-06/07 offered flawed cost impact analysis stating that the associated cost increase will be only marginal. In fact, credible estimates for real projects indicated very significant cost increase for installed medium-density and high-density SFRM. Independent estimates by government agencies (reported in G69-07/08) indicated that minimum bond strength requirement of 430 psf increases the SFRM cost by over 50%, while the requirement of 1000 psf increases SFRM cost by about 170%. Other independent estimates in the 2007 AISI report show similar cost increases: by over 50% for medium-density SFRM, and by over 230% for high-density SFRM. These increases cannot be characterized as “marginal” or “relatively small”. The cost impact of Table 403.2.4 provisions needs to be fully considered, and society’s fire protection resources need to be effectively allocated in a meaningful way.
- Several testimonies during the public hearing exploited the notion of standard-density SFRM dislodgement under its own weight for no apparent reason or due to the lack of bond strength. In fact, SFRM dislodgement are almost always linked to very specific reasons that are irrelevant to bond strength – over the building lifetime, the overwhelming majority of documented dislodgement cases are caused by direct contact/impact removals of SFRM associated with human activities such as construction, demolition, remodeling, testing, structural inspections, maintenance operations, electrical/mechanical installations, and also, associated with equipment failures, such as water leaks, improper elevator operations, and similar reasons. The information compiled in WTC Investigation Report NCSTAR 1-6A clearly illustrates typical cases, e.g.:

“Section 3.7 with photographs in Figures 3-5 through 3-10 states that, “There were many instances where SFRM had obviously been dislodged in the process of installing utilities. In some cases hardware was attached directly to the lower chords and SFRM was dislodged. These damaged areas should have been repaired when the various trades had completed their work”. Section 3.7 also states that “the overall views of the trusses showed that regions of missing insulation were minor in extent when compared with the total area of applied SFRM”.

Figure A-36 points to SFRM damage on trusses due to “tenant construction work” or “works over the years in the ceiling” by the Port Authority.

Figure A-37 points to SFRM damage on trusses “during demolition after tenants move out” as “ductwork, partitions, hangers, etc. are removed”.

Figure A-38 points to SFRM “damaged by installation of new construction”.

Figure A-39 points to SFRM “disturbed by remodeling operations”

Figure A-49 points to SFRM re-occurring “extensive damage” in the elevator shafts caused by “the slack condition in compensating cables, especially on shuttle cars, causing a chafing condition against finished spray-on fireproofing on structural steel within hoistways”.

Figure A-56 and A-57 (excerpts from LERA reports dated 1993 and 1995) point to SFRM damage in elevator shafts due to “rubbing of the hoist cable against the face of column”, or “due to testing purposes”. In one instance, the LERA reports also point to the installation of bracket as the cause for missing fireproofing.

The entire compilation of maintenance and inspections documents in the published reports of NIST WTC Investigation does not contain a single case of SFRM dislodgement linked to the lack of SFRM bond strength, despite the fact that all structural steel and steel joists in WTC towers was primed (SFRM application over primed and/or painted steel is known to reduce bond strength).

Similar causes of SFRM dislodgement, irrelevant to bond strength, were reported in the 2007 AISI report of building architects and construction contractors to evaluate their use of SFRM and their experiences with it. This survey is more relevant to the initial construction and/or major renovation phases in buildings’ lifetime, and identifies intentional removal of SFRM by construction trades as the primary cause of SFRM dislodgement.

In summary, the two leading causes of SFRM dislodgement during construction and maintenance of buildings are:

- Primary cause - intentional removal of SFRM associated with human activities, such as construction, renovation, electrical/mechanical installations, testing, inspections, maintenance operations, etc. This type of SFRM dislodgement is completely irrelevant to SFRM bond strength. Only inspections and timely repairs could address intentional removal of SFRM.
- Secondary cause - unintentional/accidental removal of SFRM associated with human activities and equipment failures. While the use of higher-density SFRM products could slightly reduce dislodgements associated with some accidental abuses, such as light abrasive actions and light impacts, existing medium-density and high-density SFRM products are still by far incapable to substantially reduce dislodgements or address all common causes of accidental removals (e.g. water leaks, repeated and stronger abrasive actions and impacts, etc). Concealment of SFRM-protected steel elements in protective envelopes (e.g. gypsum board) or behind suspended ceilings is the most effective way in avoiding accidental dislodgement due to most accidental impacts and abrasions. Again, only inspections and timely repairs could adequately address unintentional/accidental removal of SFRM.

Analysis of Proposed Change G68-06/07 to the 2006 Edition of IBC”, by Farid Alfawakhiri, Ph.D., American Iron and Steel Institute, January 2007.

Bibliography: NIST NCSTAR 1, "Federal Building and Fire Safety Investigation of the World Trade Center Disaster: Final Report on the Collapse of the World Trade Center Towers", National Institute of Standards and Technology, September 2005 (available at <http://wtc.nist.gov/>).

Carino et al, NIST NCSTAR 1- 6A, "Federal Building and Fire Safety Investigation of the World Trade Center Disaster: Passive Fire Protection", National Institute of Standards and Technology, September 2005 (available at <http://wtc.nist.gov/>).

Perry - In their approval of the new SFRM requirements during the 2006/2007 cycle, the Fire Safety Committee specifically noted that neither technical substantiation nor cost data had been provided to the committee. Last cycle (2007/2008), cost information was provided to the committee, clearly indicating that costs are far beyond the moderate 'incremental' increases alluded to by proponents last cycle. The Fire Safety Committee voted to maintain the increased SFRM bond strength provisions, "based on a lack of technical substantiation to take them out".

This committee is on record that they had no technical substantiation when they added this requirement to the code, yet they now will not remove the provisions unless they receive technical substantiation?

There is no evidence that arbitrarily tripling (from 150 psf to 430 psf) the bond strength of SFRM will provide any additional degree of safety in 75' tall buildings, and no evidence that increasing the bond strength by a factor of 7 (from 150 psf to 1000 psf) will provide any additional degree of safety in buildings >420' in height.

The extent of the cost impacts calculated by both GSA and the steel industry make it clear that the first response to this provision, if it remains, will be to look for alternatives. There has been no explanation from those touting the need for increasing SFRM bond strength for how a gypsum-board encased column (which can achieve the required hourly ratings) would compare to columns with any of the various types of SFRM.

Cost Impact: Heilstedt - The code change proposal will not increase the cost of construction.

Perry - The code change proposal will not increase the cost of construction. This change will decrease the cost of construction.

ICCFILENAME: HEILSTEDT-G6-403.2.4.doc

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee's disapproval is based on the lack of substantiating data to show that bond strength failure is not an issue for SFRM. Further, this action provides for consistency with the committees action on G42-09/10.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Lawrence G. Perry, AIA, representing Building Owners and Managers Association (BOMA) International, requests Approval as Submitted.

Commenter's Reason: This code change should be approved for the following reasons:

1. This significant, costly change was made without any evidence that it will increase either building performance or life safety, with a misleading industry statement about the 'minimal' cost impact.
2. The CTC rationale to the original code change provides a lengthy explanation of the history of this issue, and the lack of technical substantiation.

Final Action: AS AM AMPC_____ D

G44-09/10, Part I

403.4.5, 403.4.8.1, 708.14.1, Chapter 35

Proposed Change as Submitted

Proponent: Gary Lewis, Chair, ICC Ad Hoc Committee on Terrorism-Resistant Buildings

Part I - IBC

1. Add new text as follows:

403.4.5 Video surveillance system. A video surveillance system installed in accordance with NFPA 731, shall be installed in each elevator lobby provided in accordance with Section 708.14.1 and at every fifth floor of each required stairway and connected to an approved, constantly attended station. The surveillance system shall not be required to provide positive visual recognition of individual persons.

(Renumber subsequent sections.)

2. Revise as follows

403.4.8.1 Emergency power loads. The following are classified as emergency power loads:

1. **Exit signs and *means of egress* illumination required by Chapter 10;**
2. **Elevator car lighting;**
3. **Emergency voice/alarm communications systems;**
4. **Automatic fire detection systems;**
5. **Video surveillance systems;**
- ~~5-6.~~ **Fire alarm systems; and**
- ~~6-7.~~ **Electrically powered fire pumps.**

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements of Section 709 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code. In high-rise buildings the elevator lobby shall be provided with a video surveillance system installed in accordance with NFPA 731.

Exceptions:

1. through 7. *(No change to exceptions)*

3. Add new standard to Chapter 35 as follows:

NFPA

731-2008 The Standard for the Installation of Electronic Premises Security Systems

Reason: This proposal adds new requirements to the code for high-rise buildings. The purpose of this change is to increase the ability of firefighters, and other emergency responders, to develop a clear picture of conditions throughout the building which will enable them to better manage evacuation, fire suppression and other emergency response activities. The purpose is also to enhance the safety of emergency responders by enabling them to maintain better situational awareness.

The National Institute of Standards and Technology's (NIST) report on the World Trade Center (WTC) tragedy amply documented the tactical and informational difficulties experienced by emergency responders and occupants during the WTC event. Similar difficulties occur in much smaller events and they place lives at risk.

The Code already requires many systems which enhance emergency responder and occupant awareness. Their use can be improved and they can be further supplemented. Recommendation 23 of the WTC Report specifically calls for:

The establishment and implementation of detailed procedures and methods for gathering, processing, and delivering critical information through integration of relevant voice, video, graphical and written data to enhance situational awareness of all emergency responders.

This proposal seeks to improve responder awareness of conditions in the building to assist in management of an incident and improve the existing fire command center to enhance its value. Awareness is improved by requiring control center monitoring of video surveillance in stairway shafts and elevator lobbies. With the introduction of dedicated fire service elevators and occupant egress elevators into the IBC, the necessity of monitoring the status of the elevator lobbies becomes even more significant.

There will be those opponents that will claim that the amount of information generated by the video monitoring in a large building will cause "information overload". They will question the ability of the staff in the fire command center to observe all of the required video feeds at once. In response to this, please be aware that there is commercial off-the-shelf "intelligent software" that is available such that the staff of the fire command center need not observe all of these feeds; the software is "event driven" and will select information that is pertinent and display just this information. This software is currently available off-the-shelf from companies such as Johnson Control and Honeywell. The Port Authority of New York and New Jersey is currently installing a system to monitor the perimeter of the Newark airport by the use of ONE video screen. Clearly the perimeter of this airport is substantially larger than the portions of the building that are required to be monitored as a result of this code change. By requiring these video feeds, the situational awareness of the staff in the fire command center is substantially increased. While researching the availability of this software, we were informed by Mr. Alan Reiss the building manager of the World Trade Center, that he was unaware of the magnitude of the event on September 11, 2001. In fact, he commented that the people at home watching the television had a better situational awareness than he did because of the lack of information available at the fire command center. This has to be changed and this proposal will change it.

Bottom line, the video monitoring system will provide fire and emergency responders' immediate information on the life safety condition and status of the areas noted. Having such ability will exceed any expense incurred for the installation of the video monitoring system - the expense is minor to the benefit of the system. (Note: Regardless of this requirement, electronic data access systems can be installed for a reasonable cost in most buildings today). A video monitoring system will provide fire and emergency responders with accurate and up to date information on the condition and activities of the given areas for emergency responders to make tactical decisions under emergency conditions. With that said, the TRB committee encourages consideration and support for this proposal.

Bibliography: National Institute of Standards & Technology, Final Report of the National Construction safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Referenced Standards

National Fire Protection Association Standard 731, the Standard for the Installation of Electronic Premises Security Systems

Cost Impact: The code change proposal will not increase the cost of construction. These proposed amendments will increase the cost of construction, but, the increase will be modest when viewed as a percentage of total construction costs.

Analysis: Review of the proposed new standard indicated that, in the opinion of ICC staff, the standard did comply with ICC standards criteria.

ICCFILENAME: LEWIS-G3-403.12.1.doc

Public Hearing Results

Part I - IBC

Committee Action:

Disapproved

Committee Reason: The committee disapproved the proposal for a variety of reasons. The application to all high-rise buildings regardless of height was judged excessive. Providing surveillance every 5 floors did not provide very much situational awareness as intended by the proposal. Because there were so many exceptions for elevator lobbies, the effectiveness in those areas was uncertain. The occupant evacuation elevator requirements would provide communications in elevator lobbies, this system should be connected to the proposed system. There would be costs to installing such systems, especially as it relates to providing emergency power connections. The proponent should have provided more detailed cost impact information. Reference to the standard, while appropriate, was clear that the facial recognition was not required under the IBC provisions, but not for the reference contained in the IFC.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Gary Lewis, City of Summit, representing ICC Ad Hoc Committee on Terrorism Resistant Buildings, requests Approval as Modified by this Public Comment.

Replace proposal as follows:

403.4.5 Video surveillance systems. In buildings greater than 420 feet in height, a video surveillance system installed in accordance with NFPA 731 shall be installed. Video cameras shall be provided at every fifth floor in each required stairwell. The surveillance system shall not be required to provide positive visual recognition of individual persons.

(Renumber subsequent sections)

403.4.8.1 Emergency power loads. The following are classified as emergency power loads:

1. Exit signs and *means of egress* illumination required by Chapter 10;
2. Elevator car lighting;
3. Emergency voice/alarm communications systems;
4. Automatic fire detection systems;
5. Video surveillance systems required by this code;
- ~~6.~~ 6. Fire alarm systems;
- ~~7.~~ 7. Electrically powered fire pumps.

SECTION 3008 OCCUPANT EVACUATION ELEVATORS

3008.13 Two-way communication and video surveillance system. A two-way communication system and a video surveillance system shall be provided in each occupant elevator lobby for the purpose of initiating communication with the fire command center or an alternative location approved by the fire department.

3008.13.1 Design and installation. The two-way communication system shall include audible and visible signals and shall be designed and installed in accordance with the requirements of ICC 117.1.

3008.13.2 Instructions. Instructions for the use of the two-way communication system along with the location of the station shall be permanently located adjacent to each station. Signage shall comply with the ICC A117.1 requirements for visual characters.

3008.13.3 Video surveillance. Each elevator lobby shall be provided with a video surveillance system installed in accordance with NFPA 731. The surveillance system shall not be required to provide positive visual recognition of individual persons.

NFPA

731-2008 The Standard for the Installation of Electronic Premises Security Systems

Commenter's Reason: This proposal was disapproved by the Committee in Baltimore by a vote of 6-5. The Ad Hoc Committee continues to believe that emergency responders and incident commanders require enhanced situational awareness to properly manage evacuation, suppression and related emergency response activities.

Recommendation #23 of the National Institute of Standards and Technology (NIST) Final Report of the World Trade Center Disaster specifically calls for the "establishment and implementation of detailed procedures and methods for gathering, processing and delivering critical information through integration of relevant voice, video, graphical and written data to enhance the situational awareness of all emergency responders."

The disapproval from the Committee was based primarily on several issues raised at the hearing, and not an objection to the concept. The Ad Hoc Committee has revised this proposal twice in response to guidance from the General Committee and objectors, and has now further modified the language to meet all technical objections.

In response to comments by the Code Technology Committee, BOMA and a General Committee member, we have reduced the scope of the provision for stairway monitoring exclusively to apply to "super" high-rise buildings in excess of 420' in height instead of all high-rise buildings pursuant to the Committee's stated reasons. The language of this modification also addresses the Committee's stated concern about elevator lobby exceptions.

In response to the cost issue, this public comment reduces the number of devices dramatically, by deleting the provision to provide surveillance at all elevator lobbies.....surveillance would only be mandated at every fifth floor in required stairwells and in occupant egress elevator lobbies, if provided. Remember, occupant egress elevators remain optional in the IBC. If utilized, the Ad Hoc Committee is convinced that incident commanders need real-time surveillance to understand whether building occupants are utilizing or waiting for elevator service. If such elevators are not provided, the cameras would not be required in those locations.

In response to earlier CTC objections, we have removed the requirement that the video signal be sent to a 'constantly attended location', in deference to those buildings that may not have 24-hour manned security. Instead, the provision would mandate the *capability* for monitoring all required video surveillance in the fire command center.

The issue of cost was raised some estimates indicate an overall 'system' cost at about \$3,000 per device. That figure represents all associated costs, including the hardware, software, wiring, labor, general conditions, etc. While the Ad Hoc Committee believes this cost to be inflated. A 45-story building without egress elevators would require 27 devices under this proposal, with an attendant maximum cost of \$81,000. By comparison, that equates to less than \$0.10 per square foot on a typical 20,000 square foot per floor building, or less than one-tenth of one per-cent of the project construction cost.

In summary, NIST and the ICC's fire service members have attested that video monitoring of real-time building conditions are essential to timely and effective command decisions during an incident. The Ad Hoc Committee has refined this proposal and has focused the scope sufficiently such that all reasonable concerns have been met and the Committee petitions the membership for approval as modified herein.

Bibliography: National Institute of Standards and Technology, Final Report of the National Construction Safety Team on the Collapse of the World Trade Center Towers, United States Government Printing Office: Washington, D.C., September, 2005. Also, see wtc.nist.gov.

Referenced Standards:

National Fire Protection Association Standard 731, Standard for the Installation of Electronic Premises Security Systems

Cost Impact: The proposed amendments represent a minor increase in the cost of construction for certain iconic structures.

TRB Funding Disclosure: Since the inception of the Ad Hoc-TRB Committee, the ICC has fully funded the travel expenses of the Committee Chair to present the code proposals developed by the Ad Hoc Committee. Given the current economic condition, the ICC is not able to fully fund travel expenses by the Committee Chair to present the TRB proposals to you. The National Institute of Standards and Technology, a federal agency in the U.S. Department of Commerce, through a grant to the National Institute of Building Sciences, has agreed to fund the TRB Chair's travel expense *deficit*...whatever amount ICC does *not* fund...with full disclosure to the ICC. NIST has not ever, nor would, play *any* role in the deliberations of the TRB Committee in our development of code change proposals. This is entirely consistent with ICC CP#28.

Public Comment 2:

Gary Lewis, City of Summit, representing ICC Ad Hoc Committee on Terrorism Resistant Buildings, requests Approval as Modified by this Public Comment.

Replace proposal as follows:

3007.6 Elevator system monitoring. The fire service access elevator shall be continuously monitored at the fire command center by a standard emergency service interface system meeting the requirements of NFPA 72. Each fire service access elevator lobby shall be provided with a video surveillance system installed in accordance with NFPA 731. The surveillance system shall not be required to provide positive visual recognition of individual persons.

NFPA

731-2008 The Standard for the Installation of Electronic Premises Security Systems

Commenter's Reason: Concerns expressed in Baltimore regarding the provisions for video surveillance included thresholds, cost and some confusion regarding the original proposed reference to elevator lobbies in Chapter 7, which contains certain exceptions. This public comment seeks to address all of those stated concerns and reasons for disapproval. The IBC General Committee issued a split 6-5 decision in favor of disapproval in Baltimore.

Recommendation #23 of the National Institute of Standards and Technology (NIST) Final Report of the World Trade Center Disaster specifically calls for the "*establishment and implementation of detailed procedures and methods for gathering, processing and delivering critical information through integration of relevant voice, video, graphical and written data to enhance the situational awareness of all emergency responders.*"

The original G44-09/10 would have required video surveillance in *all* elevator lobbies of *all* high-rise buildings, which the Committee found excessive. The ICC Ad Hoc Committee on Terrorism Resistant Buildings reconsidered the matter and further refined the scope of lobby surveillance to the two critical needs: 1] occupant evacuation elevators if provided (see G44-09/10 TRB Public Comment #1), and 2] fire service access elevators.

Occupant evacuation elevators are an option, but the 2009 IBC now includes a first-ever provision that 'hardened' fire service access elevators be provided in all buildings greater than 120' in height. These elevators can and will be used for the transport of emergency responders and potentially building occupants in cases of emergency. Requiring video monitoring of the lobby spaces for such elevators will allow incident commanders to transmit real-time information about building conditions and occupant status to ascending responders, and will also serve as redundant protection to those responders in addition to the required communication systems.

Reference to the elevator lobby in Section 3007.6 as opposed to lobbies generally in Chapter 7 eliminates any application confusion from the original proposal.

Bibliography: National Institute of Standards and Technology, *Final Report of the National Construction Safety Team on the Collapse of the World Trade Center Towers*, United States Government Printing Office: Washington, D.C., September, 2005. Also, see wtc.nist.gov.

Referenced Standards:

National Fire Protection Association Standard 731, *Standard for the Installation of Electronic Premises Security Systems*

Cost Impact: This proposal does represent a minor increase in the cost of construction, but a portion of the cost is already absorbed in currently-required provision for continuous emergency system interface per NFPA 72, the balance representing less than two-tenths of one per cent of the project budget, a small price to pay for enhanced emergency responder and occupant life safety.

TRB Funding Disclosure: Since the inception of the Ad Hoc-TRB Committee, the ICC has fully funded the travel expenses of the Committee Chair to present the code proposals developed by the Ad Hoc Committee. Given the current economic condition, the ICC is not able to fully fund travel expenses by the Committee Chair to present the TRB proposals to you. The National Institute of Standards and Technology, a federal agency in the U.S. Department of Commerce, through a grant to the National Institute of Building Sciences, has agreed to fund the TRB Chair's travel expense *deficit*...whatever amount ICC does *not* fund...with full disclosure to the ICC. NIST has not ever, nor would, play *any* role in the deliberations of the TRB Committee in our development of code change proposals. This is entirely consistent with ICC CP#28.

G44-09/10 Part II

IFC 508.1.5 (IBC [F] 911.1.5)

Proposed Change as Submitted

Proponent: Gary Lewis, Chair, representing ICC Ad Hoc Committee on Terrorism-Resistant Buildings

Revise as follows:

508.1.5 (IBC [F] 911.1.5) Required features. The fire-command center shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air handling systems.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, firefighting equipment and fire department access and the location of fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.
18. Video monitoring for video surveillance system required by this code.

Reason: This proposal adds new requirements to the code for high-rise buildings. The purpose of this change is to increase the ability of firefighters, and other emergency responders, to develop a clear picture of conditions throughout the building which will enable them to better manage evacuation, fire suppression and other emergency response activities. The purpose is also to enhance the safety of emergency responders by enabling them to maintain better situational awareness.

The National Institute of Standards and Technology's (NIST) report on the World Trade Center (WTC) tragedy amply documented the tactical and informational difficulties experienced by emergency responders and occupants during the WTC event. Similar difficulties occur in much smaller events and they place lives at risk.

The Code already requires many systems which enhance emergency responder and occupant awareness. Their use can be improved and they can be further supplemented. Recommendation 23 of the WTC Report specifically calls for:

The establishment and implementation of detailed procedures and methods for gathering, processing, and delivering critical information through integration of relevant voice, video, graphical and written data to enhance situational awareness of all emergency responders.

This proposal seeks to improve responder awareness of conditions in the building to assist in management of an incident and improve the existing fire command center to enhance its value. Awareness is improved by requiring control center monitoring of video surveillance in stairway shafts and elevator lobbies. With the introduction of dedicated fire service elevators and occupant egress elevators into the IBC, the necessity of monitoring the status of the elevator lobbies becomes even more significant.

There will be those opponents that will claim that that the amount of information generated by the video monitoring in a large building will cause "information overload". They will question the ability of the staff in the fire command center to observe all of the required video feeds at once. In response to this, please be aware that there is commercial off-the-shelf "intelligent software" that is available such that the staff of the fire command center need not observe all of these feeds; the software is "event driven" and will select information that is pertinent and display just this information. This software is currently available off-the-shelf from companies such as Johnson Control and Honeywell. The Port Authority of New York and New Jersey is currently installing a system to monitor the perimeter of the Newark airport by the use of ONE video screen. Clearly the perimeter of this airport is substantially larger than the portions of the building that are required to be monitored as a result of this code change. By requiring these video feeds, the situational awareness of the staff in the fire command center is substantially increased. While researching the availability of this software, we were informed by Mr. Alan Reiss the building manager of the World Trade Center, that he was unaware of the magnitude of the event on September 11, 2001. In fact, he commented that the people at home watching the television had a better situational awareness than he did because of the lack of information available at the fire command center. This has to be changed and this proposal will change it.

Bottom line, the video monitoring system will provide fire and emergency responders' immediate information on the life safety condition and status of the areas noted. Having such ability will exceed any expense incurred for the installation of the video monitoring system - the expense is minor to the benefit of the system. (Note: Regardless of this requirement, electronic data access systems can be installed for a reasonable cost in most buildings today). A video monitoring system will provide fire and emergency responders with accurate and up to date information on the condition and activities of the given areas for emergency responders to make tactical decisions under emergency conditions. With that said, the TRB committee encourages consideration and support for this proposal.

Bibliography: National Institute of Standards & Technology, Final Report of the National Construction safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Referenced Standards

National Fire Protection Association Standard 731, the Standard for the Installation of Electronic Premises Security Systems

Cost Impact: The code change proposal will not increase the cost of construction. These proposed amendments will increase the cost of construction, but, the increase will be modest when viewed as a percentage of total construction costs.

Analysis: A review of the standard proposed for inclusion in the code, NFPA 731, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: LEWIS-G3-403.12.1.doc

Public Hearing Results

IFC – Part II

Committee Action:

Disapproved

Committee Reason: Consistent with the action taken to disapprove Part I.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gary Lewis, City of Summit, representing ICC Ad Hoc Committee on Terrorism Resistant Buildings, requests Approval as Modified by this Public Comment.

Modify as follows:

508.1.5 (IBC [F] 911.1.5) Required features. The fire command center shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communications system control unit.
2. The fire department communications system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air handling systems.
6. The fire-fighters control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, firefighting equipment and fire department access and the location of fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions.
13. Work table
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.
18. Capability for video monitoring for video surveillance system required by this code.

Commenter's Reason: See Commenter's reason for Part I, Public Comment 1

Final Action: AS AM AMPC____ D

G46-09/10
403.5.2, 3008.4

Proposed Change as Submitted

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing: California Fire Safety Advisory Council (CFSAC); Bill Ziegert, representing Smoke Guard, Inc.

1. Revise as follows:

403.5.2 Additional exit stairway. For buildings other than Group R-2 that are more than 420 feet (128 000 mm) in building height, one additional exit stairway meeting the requirements of Sections 1009 and 1022 shall be provided in addition to the minimum number of exits required by Section 1021.1. The total width of any combination of remaining exit stairways with one exit stairway removed shall not be less than the total width required by Section 1005.1. Scissor stairs shall not be considered the additional exit stairway required by this section.

~~**Exception:** An additional exit stairway shall not be required to be installed in buildings having elevators used for occupant self-evacuation in accordance with Section 3008.~~

2. Delete without substitution:

~~**3008.4 Additional exit stairway.** Where an additional means of egress is required in accordance with Section 403.5.2, an additional exit stairway shall not be required to be installed in buildings having elevators used for occupant self-evacuation in accordance with this section.~~

Reason:

Thornberry: We are proposing to delete the Exception to Section 403.5.2 as well as Section 3008.4 which allow the use of occupant evacuation elevators in lieu of the additional exit stairway where required by Section 403.5.2 for super high-rise buildings (buildings greater than 420 ft in height). We believe this technology is too new and unproven to allow it to substitute for a required means of egress. This position is also consistent with Section 1003.7 Elevators, Escalators and Moving Walks which prohibits elevators from being used as a component of a required means of egress. Until such time as occupant evacuation elevators (which are allowed to be used on a voluntary basis without reducing the required means of egress) have proven to be safe, reliable, and effective, this exception should be deleted from the code.

Ziegert: When the concept of Occupant Evacuation Elevators was proposed during the Palm Springs hearings in 2008, while many committee members were in favor of such a concept, the change was Disapproved primarily because it sought a tradeoff of reducing exit stair capacity (width). The proponent brought this change back to the Minneapolis Final Action hearings with substantial modifications and replaced the reduction in exit stair width with this alternate tradeoff to reduce the third stair in High Rise buildings over 420 feet (a different form of tradeoff but still a reduction in exit capacity). Justification for this tradeoff of exit capacity was never sufficiently provided, particularly when one recognizes that the elevator occupant evacuation system will only be operational until the Fire Service arrives (typically in 10 minutes or less from the first alarm). At this time Phase 1 Elevator Recall will normally be implemented which will immediately terminate the use of elevators for occupant evacuation. Following that, occupants needing to use stairs for evacuation in these very tall buildings would be limited to only the two stair systems, rather than the three stair systems the code currently mandates.

Cost Impact: The code change proposal will increase the cost of construction.

ICCFILENAME: THORNBERRY-G6-403.5.2

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The purpose of the third stairway is to allow for the fire service to take one stairway out of service for fire department activities. The third stairway is in excess to the required means of egress. Therefore, allowing for the option of occupant evacuation elevators in place of the third stairway will not reduce the required means of egress. The occupant evacuation elevator is future technology that is supported by NIST and the World Trade Center report. The tradeoff is an incentive to get effective technology into high rise buildings that will significantly reduce the time needed for evacuation of high rise buildings. This is especially important when a full building evacuation is deemed necessary. It is a significant improvement for persons with disability to allow for self-evacuation with the general population as well as to allow for them to evacuate with their mobility devices.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rick Thornberry, PE, The Code Consortium, Inc., representing California Fire Safety Advisory Council (CFSAC), requests Approval as Submitted.

Commenter's Reason: We believe that the IBC Means of Egress Code Development Committee recommendation for disapproval of this code change proposal should be overturned and the code change voted for approval. A two-thirds majority vote will be necessary to achieve an approval recommendation by the Class A voting members so it is very important that all Class A voting members carefully listen to the arguments and consider the importance of this very significant code change.

The main reason the Committee recommended disapproval was on the basis of their Committee Statement that said: "Allowing for the option of occupant evacuation elevators in place of the third stairway will not reduce the required means of egress." However, the purpose of the required third stairway in these super high-rise buildings (greater than 420 feet in height) is to assure that the minimum required exit capacity will be available in the building once the fire department arrives and takes over one of the three exit stairways for their use in gaining access to the fire floor and performing their firefighting and search and rescue operations. Thus, the code presumes that the minimum required capacity for exiting will still be provided in the building. However, if the occupant evacuation elevators are allowed to substitute for the third required exit stairway, then once the fire department arrives and takes over one of the two remaining stairways, 50% of the exit capacity will be lost since the required exit width will be reduced because of the actions of the fire department. The assumption being made by the Committee is that the occupant evacuation elevators will make up the difference due to the loss of one of the two stairways being taken over by the fire department. But are they reliable enough at this time to allow such a trade-off?

It should be noted that this is a new technology to the United States which has yet to be proven. In fact, the criteria for occupant evacuation elevators are still being developed by the ASME Committee responsible for developing the elevator requirements. It should also be noted that IBC Section 3008.3 Operation states that the occupant evacuation elevators can only be used in the normal elevator operating mode prior to Phase I Emergency Recall Operation. So it only takes one smoke detector located in any elevator lobby to terminate the elevator use when that detector is activated and automatically recalls all elevators served by that lobby. Furthermore, once the fire department arrives, they will normally recall all elevators under their Phase I Manual Recall Operation. So there will be very little time available for the occupant evacuation elevators to be utilized in the early stages of a fire emergency.

Another concern we have with the reliability of these elevator systems is in regard to potential water damage which could cause malfunctioning operations of the elevators. IBC Section 3008.10 Water Protection simply requires an "approved method" to prevent automatic sprinkler system water from infiltrating into the hoistway enclosure. An approved method is specified since there is no simple resolution to this requirement that can be met in a cost-effective manner at this time. Furthermore, the water infiltration limitations only deal with automatic sprinkler system discharge water and not with firefighting hose streams which will be used during firefighting activities by the responding fire department. The water from firefighting hose streams can often be significantly greater than the automatic sprinkler system discharge water.

Another argument stated was that this code change will eliminate an incentive to utilize occupant evacuation elevators in these very tall buildings. However, this code change does not eliminate the option to install occupant evacuation elevators. It only eliminates the trade-off. If these occupant evacuation elevators are so critical to occupant evacuation, then it follows that building owners will install them in any case in order to minimize their liability and provide enhanced fire and life safety to the building occupants.

Furthermore, the performance based design option can be used to determine how occupant evacuation elevators can be integrated with an exit system in these super high-rise buildings in a cost-effective yet safe and reliable manner. But such a trade-off should not be contained in the prescriptive code requirements for these super high-rise buildings.

Let's get some experience with the voluntary use of occupant evacuation elevators in this country that don't substitute for any of the required exit capacity before we begin to allow such trade-offs. In essence, the trade-off is a de facto substitution of an elevator system for a required means of egress which is clearly prohibited by Section 1003.7 which states: "Elevators, escalators, and moving walks shall not be used as a component of a required means of egress from any other part of the building."

It was also noted that these occupant evacuation elevators would be a significant improvement for persons with disabilities to allow for self-evacuation with the general population. We can't argue with that statement but we can point out that the International Building Code (IBC) currently provides for occupant evacuation of persons with disabilities via elevators in accordance with Section 1007.2.1 Elevators Required which is part of the requirements for the accessible means of egress.

In conclusion, now is not the time to allow for a trade-off of the required means of egress capacity for the use of occupant evacuation elevators in super high-rise buildings. Therefore, we strongly urge the Class A voting members to overturn the Committee's recommendation for disapproval and subsequently vote for approval as submitted of this code change proposal to delete the trade-off.

Final Action: AS AM AMPC_____ D

G48-09/10

403.6.1, 3007.1, 3007.1.1 (New)

Proposed Change as Submitted

Proponent: Dave Frable, representing U.S. General Services Administration

Revise as follows:

403.6.1 Fire service access elevator. In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, a minimum of ~~one~~ two elevators having a minimum 3,500 pounds (1588 kilograms) capacity serving every floor within the subject building shall be provided to serve as a fire service access elevator shall be provided in accordance with Section 3007.

Exception: One elevator having a minimum capacity of 4,000 pounds (1814 kilograms) shall be permitted instead of 2 elevators of 3,500 pounds (1588 kilograms) capacity.

3007.1 General. Where required by Section 403.6.1, every floor of the building shall be served by a fire service access ~~elevator~~ elevators. Except as modified in ~~this section~~, the Sections 3007.1 through 3007.7, fire service access ~~elevator~~ elevators shall be installed in accordance with this chapter and ASME A17.1/CSA B44.

Reason: Last Code Development Cycle, a code change was submitted to require a minimum of 3 fire service elevators. The subject proposal was disapproved by the Code Committee based on concerns that requiring a minimum of 3 fire service access elevators would have an adverse impact on a small footprint high-rise building and that requiring a minimum of 3 fire service access elevators seemed excessive. The intent of this code change is to provide a compromise that addresses the minimum number of fire service access elevators that are required in a building based on the size and capacity of the elevator and not strictly the number of elevators. The proposed text also allows for design flexibility as well as providing minimum requirements for the size and capacity of the fire service access elevators by correlating with Section 3002.4

Cost Impact: The code change proposal will increase the cost of construction.

ICCFILENAME: FRABLE-G6-403.6.1

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The option of three elevators in G49-09/10 is preferred to one or two elevators with a higher capacity car as proposed in this item. If the trade-off is capacity vs. number of elevators the fire service would prefer more elevators to allow for different elevators to be used for different purposes. Whether fire service elevators need to be also sized for stretchers can be addressed in G157-09/10.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Dave Frable, representing U.S. General Services Administration, requests Approval as Submitted.

Commenter's Reason: The intent of this code change is to address that the minimum number of fire service access elevators be based on size and capacity of the elevator and not strictly on the minimum number of elevators. In addition, it ensures that each fire service access elevator serves every floor of the building and that at least 1 fire service elevator car be of sufficient size to accommodate a 24 inch by 84 inch stretcher.

The Code Committee states in their reason statement that the option of three elevators in G49-09/10 is preferred to providing only two elevators with a higher capacity car as proposed. The Committee further states that if the trade-off is capacity vs. number of elevators the fire service would prefer to have available more elevators to allow for different elevators to be used for different purposes and to ensure an elevator car is available for fire department use.

It is our opinion, requiring a minimum of 3 fire service elevators for every building of 10 stories or more is not reasonable for all building designs and occupancy classifications. We strongly believe that without taking into consideration elevator capacity, a typical 10 story commercial office building having a small floor plate will lead to unintended architectural design consequences since each fire service elevator lobby will be required to have direct access to an exit stair. For example, a small floor plate building with two passenger elevator cars in one shaft and one service car/freight elevator car in another shaft would need both elevator lobbies providing direct access to the exit stairs while still meeting the exit remoteness requirements in the Code.

Typically in new commercial office buildings of this height, passenger elevator cars can range from a small 2,500 pound capacity elevator car, to a medium 3,500 pound capacity car, to larger 4,000 pound capacity elevator car. Therefore, the size of the available space within each car can range from 28 sq ft per car, 36 square feet per car, and to 41 sq ft per car, respectively. The premise of this code change is the larger the space within the elevator car the less number of trips and number of elevator cars the fire department may need to make to the staging floor on the upper floors of the building.

The subject exception is similar to what the City of San Francisco has required since 2007 for elevators for fire fighter use to be installed in buildings greater than 20 stories in height. One of the paragraphs within the San Francisco Fire Code states that "Where required, a minimum of one 4500 lb. capacity elevator or two 2500 lb. capacity elevators shall be provided for use as firefighter elevators but are not intended to be for exclusive use of the fire department." Therefore, it appears the City of San Francisco also believes that a minimum of one (1) fire service access is adequate if it is of sufficient size and capacity. However, 4,500 pound capacity elevator cars are typically only installed in hospitals and not commercial office buildings whereas 4,000 pound capacity cars are available in commercial office buildings.

It should also be noted that 2,500 pound capacity elevator cars can no longer accommodate the subject new stretcher dimensions and to our knowledge, a 3,500 pound capacity car can only accommodate the new stretcher dimensions if it is modified to a side door configuration opening. Whereas, the 4,000 pound elevator car will be able to accommodate the new stretcher dimensions without any door modifications.

We believe this revision will allow for maximum design flexibility as well as providing minimum requirements for the size and capacity of the fire service access elevators by correlating with Section 3002.4 and will improve the use of fire service access elevators across the country.

Lastly, it should be noted that a similar code change was submitted to the NFPA TC on Building Systems during the NFPA Code Development ROP phase and was approved.

Public Comment 2:

Dave Frable, representing U.S. General Services Administration, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

403.6.1 Fire service access elevator. In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, a minimum of two elevators having a minimum 3,500 pounds (1588 kilograms) capacity serving every floor within the subject building shall be provided to serve as a fire service access elevator in accordance with Section 3007.

~~**Exception:** One elevator having a minimum capacity of 4,000 pounds (1814 kilograms) shall be permitted instead of 2 elevators of 3,500 pounds (1588 kilograms) capacity.~~

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The intent of this code change is to address that the minimum number of fire service access elevators be based on size and capacity of the elevator and not strictly on the minimum number of elevators. In addition, it ensures that each fire service access elevator serves every floor of the building and that at least 1 fire service elevator car be of sufficient size to accommodate a 24 inch by 84 inch stretcher.

The Code Committee states in their reason statement that the option of three elevators in G49-09/10 is preferred to providing only two elevators with a higher capacity car as proposed. The Committee further state that if the trade-off is capacity vs. number of elevators the fire service would prefer to have available more elevators to allow for different elevators to be used for different purposes and to ensure an elevator car is available for fire department use.

It is our opinion, requiring a minimum of 3 fire service elevators for every building of 10 stories or more is not reasonable for all building designs and occupancy classifications. We strongly believe that without taking into consideration elevator capacity, a typical 10 story commercial office building having a small floor plate will lead to unintended architectural design consequences since each fire service elevator lobby will be required to have direct access to an exit stair. For example, a small floor plate building with two passenger elevator cars in one shaft and one service car/freight elevator car in another shaft would need both elevator lobbies providing direct access to the exit stairs while still meeting the exit remoteness requirements in the Code.

Typically in new commercial office buildings of this height, passenger elevator cars can range from a small 2,500 pound capacity elevator car, to a medium 3,500 pound capacity car, to larger 4,000 pound capacity elevator car. Therefore, the size of the available space within each car can range from 28 sq ft per car, 36 square feet per car, and to 41 sq ft per car, respectively. The premise of this code change is the larger the space within the elevator car the less number of trips and number of elevator cars the fire department may need to make to the staging floor on the upper floors of the building.

It should be noted that 2,500 pound capacity elevator cars can no longer accommodate the subject new stretcher dimensions and to our knowledge, a 3,500 pound capacity car can only accommodate the new stretcher dimensions if it is modified to a side door configuration opening. Whereas, the 4,000 pound elevator car will be able to accommodate the new stretcher dimensions without any door modifications.

We believe this revision will allow for maximum design flexibility as well as providing minimum requirements for the size and capacity of the fire service access elevators by correlating with Section 3002.4 and will improve the use of fire service access elevators across the country.

Lastly, it should be noted that a similar code change was submitted to the NFPA TC on Building Systems during the NFPA Code Development ROP phase and was approved.

Public Comment 3:

Lee J. Kranz, City of Bellevue, representing Washington Association of Building Officials Technical Code Development Committee, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

403.6.1 Fire service access elevator. In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, a minimum of two elevators, each having a minimum 3,500 pounds (1588 kilograms) capacity serving every floor within the subject building, shall be provided to serve as a fire service access elevators in accordance with Section 3007.

~~**Exception:** One elevator having a minimum capacity of 4,000 pounds (1814 kilograms) shall be permitted instead of 2 elevators of 3,500 pounds (1588 kilograms) capacity.~~

(Portions of proposal not shown remain unchanged)

Commenter's Reason: Washington Association of Building Official's Technical Code Development Committee (WABO-TCDC) agrees that more fire service access elevators (FSAE) in high-rise buildings greater than 120' in height will improve fire fighter and occupant safety by providing the ability to move suppression equipment and personnel to the fire location expediently. We believe that the economic impacts of increasing the number of FSAE from 1 to 2 (a 100% increase) is justified to provide improved safety for fire fighters and the public. WABO-TCDC recommends disapproval of proposal G-49 that requires an increase from 1 to 3 FSAE and supports the moderate increase provided in proposal G-48, as modified by this public statement. The exception to allow a single 4,000 lb. elevator instead two 3,500 lb. elevators was deleted to insure that at least 2 FSAE elevators would be installed so that if 1 were shut down there would be at least 1 available.

Final Action: AS AM AMPC D

G49-09/10

403.6.1

Proposed Change as Submitted

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII), Sean DeCrane, representing International Association of Fire Fighters (IAFF), Jack Murphy, representing Fire Safety Directors of Greater New York (FSDAGNY)

Revise as follows:

403.6.1 Fire service access elevator. In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, a minimum of ~~one~~ three fire service access elevators, or all elevators, whichever is less, shall be provided in accordance with Section 3007.

Reason: The proponents performed a survey of firefighters from across the country to explore the sufficiency of this current code requirement. Thirty-five responses were received from cities such as Charlotte, Orlando, San Francisco, Houston, Los Angeles, Fort Worth, Boston and Pittsburgh, all indicating that the number of elevators used for firefighting operations varies from 2 to 6. (Only one respondent, a suburban bedroom community indicated one elevator is sufficient for firefighting.) Firefighters experienced in high rise operations stated that the Fire Service must be able to count on **at least two** elevators at all times. They are necessary for 1) transporting firefighters to and from the staging area, usually located two floors below the fire floor; 2) moving firefighters to other floors for the purpose of search and rescue, fire extension, recon; hauling of equipment such as spare cylinders, exhaust fans, etc; and, 3) transporting those with disabilities to the building lobby.

Past experience during fires of this type (high-rise), is that on many occasions elevators are not available due to shut downs for various reasons, including problems in operation, routine maintenance, modernization programs, EMS operations in the building prior to firefighter arrival and other reasons. Without this change there will be a high chance that there will not be a Fire Service Access Elevator available for the firefighters' to perform their critical firefighting and life-saving rescue duties.

Cost Impact: This code change will increase the cost of construction.

ICCFILENAME: BLACK-G5-403.6.1

Public Hearing Results

Committee Action:

Approval as Submitted

Committee Reason: Redundancy in the number of elevators available for fire department use is critical for effective fire fighting operations in buildings tall enough to need Fire Service Access elevators. Elevators size can be addressed in G157-09/10. While there are some issues of additional cost, small foot-print buildings are addressed in the additional language of "or all elevators, whichever is less."

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Paul K. Heilstedt, PE, Hon. AIA, Chair, representing ICC Code Technology Committee (CTC), requests Approval as Modified by this Public Comment.

Modified proposal as follows:

403.6.1 Fire service access elevator. In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, a minimum of ~~three~~ two fire service access elevators, or all elevators, whichever is less, shall be provided in accordance with Section 3007. Each fire service access elevator shall have a minimum capacity of 3500 pounds.

Commenter's Reason: There were two code changes proposed to add elevator car size requirements for fire service elevators, namely:

G48: This code change proposed either two elevators (each 3500 pounds) or a single larger elevator (4000 pounds). This code change was disapproved.

G49: This code change proposed three fire service elevators but did not mandate a size. As such the typical size of 2500 pounds would be permitted. This code change was approved.

This public comment is a compromise between G48 which proposed 2 elevators and allowed an exception for 1 provided it could accommodate fire service needs such as a stretcher and this proposed change which requires 3. This comment further mandates a minimum size of 3500 pounds which is consistent with demands for fire service access and stretcher accommodation. There is no technical justification to require 3 fire service elevators.

Public Comment 2:

Dave Fable, representing U.S. General Services Administration, requests Disapproval.

Commenter's Reason: The proponents have stated that the intent of this code change is to increase the minimum number of fire service access elevators from 1 to 3 elevators based on 35 responses from a survey of firefighters who indicated that the number of elevators they used during an event ranged from 2 to 6. However, it should be noted that the survey did not indicate the size of the elevators used by the firefighters. Typically in commercial office buildings, elevator cars can range from 2,500 pound capacity elevator cars to 3,500 pound capacity elevator cars and the size of the available space within each car can range from 28 sq ft per car to 41 sq ft per car respectively. Therefore, in our opinion, the size of the car does matter and it is possible that the firefighters that responded to the survey and stated they utilized multiple elevators were using 2500 pound capacity cars.

In addition, we also believe that requiring all of the elevators in small floor plate building to be fire service access elevators will cause major unintended design consequences when trying to meet the requirement for providing direct access from the subject enclosed fire service access elevator lobbies to an exit stair. For example, a small foot-print building with two passenger elevators in one elevator lobby and a two service car elevators in another lobby would need to be designed such that the exit stairs were remote and still had direct access to each of the elevator lobbies.

We also feel that the proponent's statement that "past experience during fires of this type (high-rise), is that on many occasions elevators are not available due to shut downs for various reasons" is based on the older technology elevators and not elevators using state-of-the-art technology which the subject fire service access elevators will have incorporated into them. Based on our discussions with elevator industry representatives, elevators using today's technology are more reliable and require less maintenance than elevators in the past.

However, the most compelling reason for disapprove of this code change is that as currently written the subject proposal will not meet the intent stated in proponents reason statement. The proponents have stated that "without this change there will be a high chance that there will not be a fire service access elevator available for the firefighters' to perform their critical firefighting and life-saving rescue duties". However, even if one agrees with this statement; based on the requirements in 3007.1, only one (1) of the three (3) designated fire service access elevators will be required to serve every floor and therefore all three (3) designated fire service elevators may not serve every floor, and may lead to confusion during fire department operations as well as unintended consequences.

Lastly, it should be noted that a similar code change was submitted to the NFPA TC on Building Systems during the NFPA Code development ROP phase and was disapproved.

Public Comment 3:

Lee J. Kranz, City of Bellevue, representing Washington Association of Building Officials Technical Code Development Committee, requests Disapproval.

Commenter's Reason: Washington Association of Building Official's Technical Code Development Committee (WABO-TCDC) believes the proposed requirement to provide 3 fire service access elevators (FSAE) in high-rise buildings greater than 120' in height is excessive. This change could increase the cost of construction to the point where it may become economically unrealistic for many high-rise projects to proceed.

WABO-TCDC agrees that additional FSAE in high-rise buildings would improve fire fighter safety and the ability to move suppression equipment and personnel to the fire location expediently but the economic impacts of increasing the number from 1 to 3 (a 200% increase) is not justified. Requiring 3 FSAE would also have an adverse impact on small footprint high-rise buildings.

WABO-TCDC suggests disapproval of G-49 and supports a moderate increase provided in proposal G-48, as modified by our public statement.

Public Comment 4:

Michael Perrino, representing Code Consultants, Inc., requests Disapproval.

Commenter's Reason: This code change requires a single fire department elevator in buildings up to 120 feet. At that threshold the minimum number jumps to three. No justification was put forth for requiring a 200 percent increase in the number of elevators once an imaginary line in the sky is crossed.

While there may be validity to the need for increased fire fighter access, the code has generally addressed such needs through progressively increasing requirements. Should there be a threshold where two elevators are required? Then another where three are required?

This argument was never fully explained at the hearings. Without justification for the sudden jump in requirements (from one to three) there should be a review of what the proper thresholds may be and whether a progressive increase is a more appropriate method to address this issue.

Public Comment 5:

Lawrence G. Perry, AIA, representing Building Owners and Managers Association (BOMA) International, requests Disapproval.

Commenter's Reason: This code change proposal should be Disapproved for the following reasons:

1. There is inadequate technical justification to mandate three fire service access elevators, particularly in all buildings >120' in height.
2. The current, brand new provisions in the 2009 code require at least one fire service access elevator. While not required, the vast majority of designs would chose to also make this elevator the required ambulance stretcher elevator, since access to each floor of the building must be provided by each type.
3. The current provisions were specifically crafted to allow the use of either the 'general public' elevator lobby or a separate lobby to serve as the required fire service access lobby. By mandating multiple elevators, the size of the required lobby increases significantly, and the likelihood of a design choosing to use a separate lobby is significantly reduced. Combining this with the potential for very tall buildings to also use occupant evacuation elevators, their efficiency would be significantly impacted by multiple fire service access elevators and conflicting lobby uses.
4. A lot of the testimony provided in support of this change made it sound as if elevators are not ever used, and could not ever be used, by the fire service if not for the newly-added fire service access elevator provisions. This is contrary to current ongoing practice in virtually all major jurisdictions.

Final Action: AS AM AMPC____ D

G159-09/10
3007.2 (New)

Proposed Change as Submitted

Proponent: Dave Frable, representing U.S. General Services Administration

Add new section as follows:

3007.2 Phase I Emergency Recall Operation. An independent, three-position, key-operated "Fire Recall" switch shall be provided at the designated level for each fire service access elevator or for each group of fire service access elevators in accordance with the requirements in ASME A17.1/CSA B44. In addition, actuation of any building fire alarm initiating device shall initiate Phase I emergency recall operation on all fire service access elevators in accordance with the requirements in ASME A17.1/CSA B44. All other elevators shall remain in normal service unless Phase I emergency recall operation is manually initiated by a separate, required three-position key-operated "Fire Recall" switch or automatically initiated by the associated elevator lobby and elevator machine room smoke detectors.

(Renumber subsequent sections)

Reason: The intent of this code change is to provide further clarification in meeting the original intent regarding the design and operation of fire service access elevators. This code change will also ensure the subject elevators can be recalled quickly at the designated level by the responding firefighters.

Cost Impact: The code change proposal will increase the cost of construction.

ICCFILENAME: FRABLE-G7-3007.2

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

3007.2 Phase I Emergency recall operation. An independent, three-position, key-operated "Fire Recall" switch shall be provided at the designated level for each fire service access elevator or for each group of fire service access elevators in accordance with the requirements in ASME A17.1/CSA B44. In addition, actuation of any building fire alarm initiating device shall initiate Phase I emergency recall operation on all fire service access elevators in accordance with the requirements in ASME A17.1/CSA B44. All other elevators shall remain in normal service unless Phase I emergency recall operation is manually initiated by a separate, required three-position key-operated "Fire Recall" switch or automatically initiated by the associated elevator lobby ~~and~~ hoistway or elevator machine room smoke detectors.

Committee Reason: The modification to the proposal is to coordinate with what is required in ASME A17.1 and will require activation of the fire recall from all three locations listed. The proposal provides the fire service a standardized way to initiate the fire recall process.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Dave Frable, representing U.S. General Services Administration, request Approval as Modified by this Public Comment.

Further modify the proposal as follows:

3007.2 Phase I Emergency recall operation. ~~An independent, three-position, key-operated "Fire Recall" switch shall be provided at the designated level for each fire service access elevator or for each group of fire service access elevators in accordance with the requirements in ASME A17.1/CSA B44. In addition, a~~ Actuation of any building fire alarm initiating device shall initiate Phase I emergency recall operation on all fire service access elevators in accordance with the requirements in ASME A17.1/CSA B44. All other elevators shall remain in normal service unless Phase I emergency recall operation is manually initiated by a separate, required three-position key-operated "Fire Recall" switch or automatically initiated by the associated elevator lobby, hoistway or elevator machine room smoke detectors. In addition, if the building also employs occupant evacuation elevators in accordance with Section 3008, an independent, three-position, key-operated "Fire Recall" switch conforming to the applicable requirements in ASME A17.1/CSA B44 shall be provided at the designated level for each fire service access elevator.

Commenter's Reason: The intent of the modification is for clarification purposes and to correct any misinterpretation of the subject paragraph. As currently written, we are unsure how the subject text will be interpreted and enforced by the Building Official. The subject revised text will not adversely impact the overall intent of the proposal to provide the fire service a standardized way to initiate the fire recall process for the fire service access elevators.

Public Comment 2:

Brian Black, BDBlack Code, Inc., representing National Elevator Industry Inc., request Disapproval.

Commenter's Reason: The ability to place elevators into service while others in a group of elevators are being used to fight a fire is both unnecessary and dangerous. It would allow the public to reenter the upper stories of a building, move from floor to floor within the building, and possibly reach a fire floor during an active fire. In an emergency situation, a firefighter could mistakenly recall a single elevator and not even be aware that the remaining elevators have not been recalled and are thus available to the public.

This type of requirement is appropriate where Occupant Evacuation Elevators (OEE) are in place because it allows fire fighters to release elevators from Phase II operation so that they can return to the affected floors and be used for evacuation purposes. The critical distinction is that the elevators in OEE mode cannot be used by the public to reenter the upper stories of the building or migrate from floor to floor within the building. There is no need for this type of operation where OEE is not installed in the building.

Finally, operation and function of the fire recall elevator keys are controlled by ASME A17.1/CSA B44. Any modifications to the code's requirements to account for Fire Service Access or Occupant Evacuation Elevators should remain in that reference standard.

Final Action: AS AM AMPC____ D

G160-09/10
3007.2.1

Proposed Change as Submitted

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing: California Fire Safety Advisory Council (CFSAC)

Revise as follows:

3007.2 Hoistway enclosures protection. The fire service access elevator hoistway shall be located in a shaft enclosure complying with Section 708.

3007.2.1 Structural integrity of hoistway enclosures. The fire service access elevator hoistway shaft enclosure shall comply with Section 403.2.3.

Reason: This proposed code change is a follow up to the Cal Chiefs Code Change G194-07/08 which was disapproved in Minneapolis. That code change was disapproved mainly because it was based on a reference to the hose stream test in ASTM E119 for determining the structural integrity of the shaft enclosure. However, Code Change G65-07/08 by the Gypsum Association, which also addressed the issue of structural integrity of exit stairway and elevator hoistway shaft enclosures, was approved as modified in Minneapolis by Public Comment #2. That code change provided for another means for assessing the structural integrity of shaft enclosures, specifically for buildings known as super high-rise buildings (those greater than 420 ft in height). And it was supported by a NIST representative in response to one of the recommendations made in the NIST World Trade Center Report. Since it was approved for those conditions, it also seems appropriate that such structural integrity criteria should also be provided for the protection of fire service access elevator hoistways. These hoistways perform a very critical function protecting the responding fire fighters while the elevator assists them in gaining access to the fire floor in buildings generally more than 120 ft in height.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: With the reference to Section 403.2.3, it is not clear if the requirement for hardened shaft would be applicable for all Fire Service Access elevators (starting at 120 feet), or just those in Seismic Category III and IV or only at buildings taller than 420 feet. The intent of the proponent is for all Fire Service Access elevators to be hardened at 120 feet regardless of seismic category. The correct placement for this requirement is in Section 402.3.2. Justification for the additional costs must be provided.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rick Thornberry, PE, The Code Consortium, Inc., representing California Fire Safety Advisory Council (CFSAC), requests Approval as Modified by the Public Comment.

Modify this proposal as follows:

3007.2.1 Structural integrity of hoistway enclosures. The fire service access elevator hoistway shaft enclosure shall comply with Sections 403.2.3.1 through 403.2.3.4.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This Public Comment responds to the main reason the IBC Means of Egress Code Development Committee recommended disapproval. The Committee was basically in support of the concept of the code change but was concerned about the confusion that would occur based on how Section 403.2.3 was referenced and how it was intended to apply regarding the height and type of high-rise building that would trigger the requirement for the structural integrity of fire service access elevator hoistway enclosures. So the proposed revision in this Public Comment makes specific reference to Sections 403.2.3.1 through 403.2.3.4 which describe how the structural integrity of the hoistway enclosure is to be constructed. Thus, the requirement applies to any fire service access elevator hoistway provided in a building as required by Section 403.6.1 which is triggered at 120 ft in height above the lowest level of fire department vehicle access.

Final Action: AS AM AMPC____ D

G165-09/10
3007.7.1, 3008.15.1

Proposed Change as Submitted

Proponent: Brian Black BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII), Sean DeCrane, representing, International Association of Fire Fighters (IAFF), Jack Murphy, representing Fire Safety Directors Association of Greater New York (FSDAGNY)

Revise as follows:

3007.7.1 Protection of wiring or cables. Wires or cables that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected by construction having a minimum ~~4~~2-hour fire-resistance rating or shall be circuit integrity cable having a minimum ~~4~~2-hour fire resistance rating.

3008.15.1 Protection of wiring or cables. Wires or cables that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected by construction having a minimum ~~4~~2-hour fire-resistance rating or shall be circuit integrity cable having a minimum ~~4~~2-hour fire resistance rating.

Reason: RE: 3007.7.1: The safety of firefighters during their firefighting operations is dependent upon the life safety support systems listed in Section 3007 being maintained during the critical first 2 hours of their efforts. Locating, surrounding, confining and extinguishing the fire, as well as removing those whose lives are in jeopardy, will take time. If the fire is not under control by 2 hours into the effort, then it is probably time to evacuate. Providing the 2 hour protection will provide the necessary safety factor for firefighters to undertake the firefighting and rescue operations without increased concern for system failure. The 2-hour rating is consistent with the hoistway fire rating and fire pump feeder enclosure rating. This request has the full support of the firefighting community and is not unreasonable when it is considered that this will allow for more time to ensure the full evacuation of the building.

RE: 3008.15.1: The safety of building occupants evacuating a building is dependent upon the life safety support systems listed in Section 3008 being maintained during the critical hours of evacuation. The 2-hour rating is consistent with the hoistway fire rating and fire pump feeder enclosure rating. This request has the full support of the firefighting community and is not unreasonable when it is considered that this will allow for more time to ensure the full evacuation of a building.

Cost Impact: This code change proposal will increase the cost of construction.

ICCFILENAME: BLACK-G8-10-3008.15.1.doc

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal was disapproved because no technical justification was provided for the increase for the fire-resistance rating for cable protection. Most of the wiring for elevators can be run inside the protected shaft.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Brian Black, BDBlack Code, Inc., representing National Elevator Industry Inc., requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

3007.7.1 Protection of wiring or cables. Wires or cables that are located outside of the elevator hoistway and machine room and that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected by construction having a minimum 2-hour fire-resistance rating or shall be circuit integrity cable having a minimum 2-hour fire resistance rating.

3008.15.1 Protection of wiring or cables. Wires or cables that are located outside of the elevator hoistway and machine room and that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to occupant evacuation elevators shall be protected by construction having a minimum 2-hour fire-resistance rating or shall be circuit integrity cable having a minimum 2-hour fire resistance rating.

Commenter's reason: The committee stated "no technical justification was provided" for this proposal in that "most of the wiring for elevators can be run inside the elevator shaft". This proposed modification addresses the portion of the wiring that is outside of the 2-hour protected hoistway (power feeders for elevators, HVAC feeders, etc.). It essentially fixes the weak link created by horizontal runs from the transformer to the machine room. The cost will be negligible when compared to the original proposal.

Final Action: AS AM AMPC____ D

G169-09/10

3008.1.1 (New)

Proposed Change as Submitted

Proponent: Bill Ziegert, Smoke Guard, Inc, representing self.

Add new text as follows:

3008.1.1 Occupant evacuation elevators permitted. Occupant evacuation elevators shall be permitted only when the elevator code (ASME A17.1/CSA B44 or other) adopted by the jurisdiction contains specific requirements for the design, operation and maintenance of emergency evacuation operation (EEO).

Reason: Occupant Evacuation Elevators require many special operational / design requirements not found in the Building Code, and currently not included in any edition issued or under development of the ASME A17.1/CSA B44 Elevator Code. The proper operation and sequencing of the elevators to efficiently move occupants from the affected floors is the most important part of the occupant evacuation system and incorporation of this functionality currently allowed under the building code should not be allowed until the Elevator systems are designed with this additional functionality adequately addressed.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: ZIEGERT-G2-3008.1.1

Public Hearing Results

WTC

Page 20 of 31

Committee Action:

Disapproved

Committee Reason: The AMSE standard does not currently include specifics for Occupant Evacuation Elevators. Requiring the standard to have specific requirements before this option could be used would effectively prohibit Occupant Evacuation Elevators at this time. ASME should move forward to include specific information. The IBC needs to move forward to provide direction for this new technology. Involvement of the fire department and code official during construction and development of the fire and safety evacuation plans will address specific control issues on a case by case basis until the ASME standard is complete.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Bill Ziegert, Smoke Guard, Inc., representing self, requests Approval as Submitted.

Commenter's Reason: Occupant Evacuation Elevators require many special operational / design requirements not found in the *International Building Code*, and currently not included in any issued edition of the ASME A17.1/CSA B44 Elevator Code. While a volunteer task group chartered by ASME A17.1 including NIST, elevator experts, fire service representatives, human factors experts, and building code representatives from NFPA and ICC, have been working diligently on developing the proper requirements to be included in the elevator code, the new language will not appear before the 2013 version of A17.1.

It is impossible to safely conduct Occupant Evacuation using elevators until significant and substantial design enhancements are included in the elevator system design. The guidance for these is absent in the IBC, since all parties recognize that they should be appropriately included in the elevator code.

This change would not prohibit the consideration of Occupation Evacuation Elevator systems, just delay the implementation until both the adopted building code and elevator code concurrently contain the minimum design requirements for these systems.

The committee rational that "Involvement of the fire department and code official during construction and development of the fire and safety evacuation plans will address specific control issues on a case by case basis until the ASME standard is complete" fails to recognize the exceptional complexity of how these systems must integrate with not only the elevator system, but also fire service protocols during high rise fires. No building or fire official should undertake these decisions, particularly since a high level of understanding of the current requirements of A17.1 is required.

Final Action: AS AM AMPC___ D

**G171-09/10
3008.4 (New)**

Proposed Change as Submitted

Proponent: Dave Frable, representing U.S. General Services Administration

Add new text as follows:

3008.4 Phase I Emergency Recall Operation. An independent, three-position, key-operated "Fire Recall" switch shall be provided at the designated level for each occupant evacuation elevator in accordance with the requirements in ASME A17.1/CSA B44.

(Renumber subsequent sections)

Reason: The intent of this code change is to provide further clarification in meeting the original intent regarding the design and operation of fire service access elevators. This code change will also ensure the subject (as specific) elevators can be recalled quickly at the designated level by the responding firefighters.

Cost Impact: The code change proposal will increase the cost of construction.

ICCFILENAME: FRABLE-G8-3008.4

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposed text allows flexibility for individual recall in addition to bank recall. This will help fire department efficiency when using the Occupant Evacuation Elevators during evacuation events.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Dave Frable, representing U.S. General Services Administration, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

3008.4 Phase I Emergency recall operation. An independent, three-position, key-operated "Fire Recall" switch complying to the applicable requirements in ASME A17.1/CSA B44 shall be provided at the designated level for each occupant evacuation elevator ~~in accordance with the requirements in ASME A17.1/CSA B44.~~

Commenter's Reason: The intent of the modification is for clarification purposes and to correct any misinterpretation of the subject paragraph. As currently written, we are unsure how the subject text will be interpreted and enforced by the Code Official. The subject revised text will not adversely impact the overall intent of the proposal.

Public Comment 2:

Brian Black, BDBlack Codes, Inc., representing National Elevator Industry Inc., requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

3008.4 Phase I Emergency recall operation. An independent, three-position, key-operated "Fire Recall" switch complying with ASME A17.1/CSA B44 shall be provided at the designated level for each occupant evacuation elevator ~~in accordance with the requirements in ASME A17.1/CSA B44.~~

Commenter's Reason: This revision makes it clear that it is the three-position, key-operated "Fire Recall" switch and not the Occupant Evacuation Elevator (OEE) system that must comply with ASME A17.1/CSA B44. This is critical as the Safety Code for Elevators and Escalators has yet to have OEE requirements in it. A

Final Action: AS AM AMPC _____ D

G173-09/10
3008.9, 3008.9.1 (New)

Proposed Change as Submitted

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing: California Fire Safety Advisory Council (CFSAC)

Revise as follows:

3008.9 Hoistway enclosure protection. ~~The~~ Occupant evacuation elevators hoistways shall be located in a ~~hoistway shaft enclosure(s)~~ complying with Section 708.

3008.9.1 Structural integrity of hoistway enclosures. Occupant evacuation elevator hoistway shaft enclosures shall comply with Section 403.2.3.

Reason: This code change is a follow up to Code Change G65-07/08 by the Gypsum Association which also addressed the issue of structural integrity of exit stairway and elevator hoistway shaft enclosures in super high-rise buildings (those greater than 420 ft in height). It was approved as revised by Public Comment #2 at the ICC Final Action Hearings held in Minneapolis, MN.

In our opinion, it follows that the structural integrity requirements for super high-rise building exit stairway and elevator hoistway shaft enclosures should also apply to elevator hoistway shaft enclosures provided for occupant evacuation elevators which are just as critical for life safety protection. Such new technology for evacuation of occupants should be provided with the highest level of fire protection that is reasonably possible in order to assure that the elevators will be available during a fire emergency to serve their intended purpose of evacuating the occupants. Certainly, the structural integrity of the elevator hoistway shaft enclosures should be required to have some reasonable degree of physical protection to assure that the hoistway shaft enclosures will remain in place when needed during a fire or other emergency.

Cost Impact: The code change proposal will increase the cost of construction.

ICCFILENAME: THORNBERRY-G5-3008.9

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This is the wrong place in the code for this requirement. This requirement for structural integrity needs to be incorporated into the high-rise provisions in Section 403.2.3. With this referenced, if the designer chose to provide Occupant Evacuation Elevators in building less than 420 feet it is not clear if the shaft would still have to meet the structural integrity requirements in Category I and II Seismic areas.

Assembly Action:

None

Individual Consideration Agenda

WTC

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rick Thornberry, PE, The Code Consortium, Inc., representing California Fire Safety Advisory Council (CFSAC) requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

3008.9.1 Structural integrity of hoistway enclosures. Occupant evacuation elevator hoistway shaft enclosures shall comply with Sections ~~403.2.3~~ 403.2.3.1 through 403.2.3.4.

(Portions or proposal not shown remain unchanged)

Commenter's Reason: This Public Comment responds to the main reason the IBC Means of Egress Code Development Committee recommended disapproval. The Committee was basically in support of the concept of the code change but was concerned about the confusion that would occur based on how Section 403.2.3 was referenced and how it was intended to apply regarding the height and type of high-rise building that would trigger the requirement for the structural integrity of occupant evacuation elevator hoistway enclosures. So the proposed revision in this Public Comment makes specific reference to Sections 403.2.3.1 through 403.2.3.4 which describe how the structural integrity of the hoistway enclosure is to be constructed. Thus, the requirement applies to any occupant evacuation elevator hoistway provided in a building regardless of height.

Final Action: AS AM AMPC_____ D

F27-09/10

510, 502.1, Appendix J, 105.7.12 (New)

Proposed Change as Submitted

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

1. Revise as follows:

SECTION 510 EMERGENCY RESPONDER RADIO COVERAGE

510.1 Emergency responder radio coverage in new buildings. All new buildings shall have *approved* radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the *building code official* and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained in lieu of an *approved* radio coverage system.
2. Where it is determined by the *fire code official* that the radio coverage system is not needed.

~~510.3~~ 510.2 Emergency responder radio coverage in existing buildings. Existing buildings that do not have *approved* radio coverage for emergency responders within the building shall be equipped with such coverage according to one of the following:

1. Whenever existing wired communication system cannot be repaired or is being replaced, or where not *approved* in accordance with Section 510.1 Exception 1.
2. Within a time frame established by the adopting authority.

~~J101.2~~ 510.3 Permit required. A construction permit ~~is required~~ for installation of or modification to emergency responder radio coverage systems and related equipment is required as specified in Section 105.7.12. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

510.4 Technical requirements. Systems, components, and equipment required to provide emergency responder radio coverage system shall comply with Sections 511.4.1 through 511.4.2.5.

~~510.2~~ 510.4.1 Radio signal strength. The building shall be considered to have acceptable emergency responder radio coverage when signal strength measurements in 95 percent of all areas on each floor of the building meet the signal strength requirements in Sections ~~510.2.4~~ 510.4.1.1 and ~~510.2.2~~ 510.4.1.2.

~~510.2.1~~ **510.4.1.1 Minimum signal strength into the building.** A minimum signal strength of -95 dBm shall be receivable within the building.

~~510.2.2~~ **510.4.1.2 Minimum signal strength out of the building.** A minimum signal strength of -100 dBm shall be received by the agency's radio system when transmitted from within the building.

~~J103.1~~ **510.4.2 System design.** The emergency responder radio coverage system shall be designed in accordance with Sections ~~510.3.2.4~~ **510.4.2.1** through ~~510.3.2.5~~ **510.4.2.5**.

~~J103.1.1~~ **510.4.2.1 Amplification systems allowed.** Buildings and structures which cannot support the required level of radio coverage shall be equipped with a radiating cable system, a distributed antenna system with Federal Communications Commission (FCC)-certified signal boosters, or other system approved by the *fire code official* in order to achieve the required adequate radio coverage.

~~J103.1.2~~ **510.4.2.2 Technical criteria.** The *fire code official* shall maintain a document providing the specific technical information and requirements for the emergency responder radio coverage system. This document shall contain, but not be limited to, the various frequencies required, the location of radio sites, effective radiated power of radio sites, and other supporting technical information.

~~J103.1.3~~ **510.4.2.3 Secondary power.** Emergency responder radio coverage systems shall be provided with an *approved* secondary source of power. The secondary power supply shall be capable of operating the emergency responder radio coverage system for a period of at least 12 hours. When primary power is lost, the power supply to the emergency responder radio coverage system shall automatically transfer to the secondary power supply.

~~J103.1.4~~ **510.4.2.4 Signal booster requirements.** If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a NEMA4-type water proof cabinet.
2. Battery systems used for the emergency power source shall be contained in a NEMA4-type water proof cabinet.
3. ~~The system shall include automatic alarming of malfunctions of the signal booster system and battery system. Any resulting trouble alarm shall be automatically transmitted to an approved central station or proprietary supervising station as defined in NFPA 72 shall be electrically supervised and monitored by a supervisory service, or when approved by the fire code official, shall sound an audible signal at a constantly attended location.~~
4. Equipment shall have FCC Certification prior to installation.

~~J103.1.5~~ **510.4.2.5 Additional frequencies and change of frequencies.** The emergency responder radio coverage system shall be capable of modification or expansion in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC.

~~J103.2~~ **510.5 Installation requirements.** The installation of the public safety radio coverage system shall be in accordance with Sections ~~J103.2.4~~ **510.5.1** through ~~J103.2.5~~ **510.5.5**.

~~J103.2.1~~ **510.5.1 Approval prior to installation.** No amplification system capable of operating on frequencies licensed to any public safety agency by the FCC shall be installed without prior coordination and approval of the *fire code official*.

~~J103.2.3~~ **510.5.3 Minimum qualifications of personnel.** The minimum qualifications of the system designer and lead installation personnel shall include:

1. A Valid FCC issued General Radio Operators License, and
2. Certification of in-building system training issued by a nationally recognized organization, school or a certificate issued by the manufacturer of the equipment being installed.

The agency may waive these requirements upon successful demonstration of adequate skills and experience satisfactory to the *fire code official*.

~~J103.2.4~~ **510.5.4 Acceptance test procedure.** When an emergency responder radio coverage system is required, and upon completion of installation, the building *owner* shall have the radio system tested to ensure that two-way coverage on each floor of the building is a minimum of 90 percent. The test procedure shall be conducted as follows:

1. Each floor of the building shall be divided into a grid of 20 approximately equal areas.
2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system.
3. A maximum of two nonadjacent areas will be allowed to fail the test.

4. In the event that three of the areas fail the test, in order to be more statistically accurate, the floor may be divided into 40 equal areas. A maximum of four nonadjacent areas will be allowed to fail the test. If the system fails the 40-area test, the system shall be altered to meet the 90 percent coverage requirement.
5. A test location approximately in the center of each grid area will be selected for the test, then the radio will be enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire area. If the test fails in the selected test location, that grid area shall fail, and prospecting for a better spot within the grid area will not be allowed.
6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building owner will be required to rerun the acceptance test to reestablish the gain values.
7. As part of the installation a spectrum analyzer or other suitable test equipment shall be utilized to insure spurious oscillations are not being generated by the subject signal booster. This test will be conducted at time of installation and subsequent annual inspections.

~~J103.2.5~~ 510.5.5 FCC compliance. The emergency responder radio coverage system installation and components shall also comply with all applicable federal regulations, including but not limited to, FCC 47 CFR 90.219.

~~J103.3~~ 510.6 Maintenance. The emergency responder radio coverage system shall be maintained operational at all times in accordance with Sections ~~540.5.4~~ 510.6.1 through ~~540.5.3~~ 510.6.3.

~~J103.3.1~~ Maintenance. The public radio coverage system shall be maintained operational at all times.

~~J103.3.2~~ Permit required. A construction permit, as required by Section 105.7.5 of the *International Fire Code*, shall be obtained prior to the modification or alteration of the emergency responder radio coverage system.

~~J103.3.3~~ 510.6.1 Testing and proof of compliance. The emergency responder radio coverage system shall be inspected and tested annually or whenever structural changes occur including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following:

1. In-building coverage test as described in Section ~~J103.2.4~~ 510.5.4.
2. Signal boosters shall be tested to ensure that the gain is the same as it was upon initial installation and acceptance.
3. Backup batteries and power supplies shall be tested under load of a period of one hour to verify that they will properly operate during an actual power outage. If within the one hour test period the battery exhibits symptoms of failure, the test shall be extended for additional one hour periods until the integrity of the battery can be determined.
4. All other active components shall be checked to verify operation within the manufacturer's specifications.
5. At the conclusion of the testing a report which shall verify compliance with Section ~~J103.3.4~~ 510.5.4 be submitted to the *fire code official*.

~~J103.3.4~~ 510.6.2 Additional frequencies. The building *owner* shall modify or expand the emergency responder radio coverage system at their expense in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC. Prior approval of a public safety radio coverage system on previous frequencies does not exempt this section.

~~J103.3.5~~ 510.6.3 Field testing. Agency personnel shall have the right to enter onto the property at any reasonable time to conduct field-testing to verify the required level of radio coverage.

~~J102.1~~ Definitions. For the purpose of this appendix, certain terms are defined as follows:

502.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AGENCY. Any emergency responder department within the jurisdiction that utilizes radio frequencies for communication. This could include, but not be limited to, various public safety agencies such as fire department, emergency medical services and law enforcement.

2. Add new text as follows:

105.7.12 Radio coverage system. A construction permit is required for installation of or modification to emergency responder radio coverage systems and related equipment. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

(Renumber subsequent sections)

3. Delete Appendix J without substitution:

APPENDIX J EMERGENCY RESPONDER RADIO COVERAGE

Reason: This proposal takes the requirements for emergency responder radio coverage made last code cycle and finishes the process. Appendix J was included in the 2009 edition and contains the installation and testing criteria for the emergency responder radio coverage system. In this proposal, the entire appendix is relocated into the code. This action is the result of a request by the Code Development Committee last cycle and can be seen in their Reason Statement in Report on Hearings.

As the appendix is relocated into the code, some minor clarifications occurred. The following revisions are made:

1. 510.1 – the term “new” is included to clarify the difference between Section 510.1 (new construction) and 510.2 (existing construction)
 2. 510.3 – this section has been relocated and includes three sections from the appendix which dealt with permits. Sections J101.2, J103.2.2 and J103.3.2 all referenced permits. This revision will provide a single section which covers permits for these systems.
 3. 105.7.12 – this permit requirement is added to Chapter 1. Since the appendix is deleted, the permit requirement also needs to be located within the code. This is editorial.
 4. 510.4.2.4 – Item 3 is revised to correlate with the new wording used in other sections of the code when referencing monitoring of systems.
- 510.6 – The two sections from the Appendix J103.3 and J103.3.1 have been combined into one section for simplicity.

Cost Impact: The code change proposal will increase the cost of construction.

ICCFILENAME: LARIVIERE-F33-510.DOC

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

510.2 Emergency responder radio coverage in existing buildings. Existing buildings that do not have approved radio coverage for emergency responders within the building shall be equipped with such coverage according to one of the following:

1. Whenever existing wired communication system cannot be repaired or is being replaced, or where not *approved* in accordance with Section 510.1 Exception 1.
2. Within a time frame established by the adopting authority.

Exception: Where it is determined by the fire code official that the radio coverage system is not needed.

(Portions of the proposed code change not shown remain unchanged.)

Committee Reason: The committee felt that the specific requirements for emergency responder radio coverage are important enough to warrant relocation into the code text rather than being “hidden” in an appendix. The modification provides the same consideration for existing buildings as Section 510.1 does for new buildings.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Michael E. Dell'Orfano representing Fire Marshal's Association of Colorado, requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

510.1 Emergency responder radio coverage in new buildings. All new buildings shall have *approved* radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the *building code official* and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained in lieu of an *approved* radio coverage system.
2. Where it is determined by the *fire code official* that the radio coverage system is not needed.
3. One- and two-family dwellings and townhouses.

510.2 Emergency responder radio coverage in existing buildings. Existing buildings that do not have *approved* radio coverage for emergency responders within the building shall be equipped with such coverage according to one of the following:

1. Whenever existing wired communication system cannot be repaired or is being replaced, or where not *approved* in accordance with Section 510.1 Exception 1.
2. Within a time frame established by the adopting authority.

Exceptions:

1. Where it is determined by the fire code official that the radio coverage system is not needed.
2. One- and two-family dwellings and townhouses.

(Portions of proposal not shown, remain unchanged)

Commenter's Reason: This public comment recommends an additional modification to F27-09/10 by adding an exception for new and existing one- and two-family dwellings and townhouses. Installation of an amplification system, when needed to enhance radio coverage, is unreasonable in a one- and two-family dwelling or townhouse due to the inability to verify maintenance Of these systems. Inadequate maintenance may not only decrease reliability of the individual system, but may also degrade the performance of the overall public safety communication system. Critical periodic inspections would need to be performed to verify the system is operational, secondary power is maintained, signal strengths are appropriate, and frequency changes are accommodated. Such inspections, and the corresponding corrections of system deficiencies, would be difficult or impossible to achieve. It is also not common practice in the fire service to conduct code enforcement inspections in one- and two-family dwellings and townhouses.

Public Comment 2:

Michael E. Dell'Orfano representing Fire Marshal's Association of Colorado, requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

510.1 Emergency responder radio coverage in new buildings. All new buildings shall have *approved* radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

- 4- Where *approved* by the *building code official* and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained in lieu of an *approved* radio coverage system.
- 2- ~~Where it is determined by the *fire code official* that the radio coverage system is not needed.~~

510.2 Emergency responder radio coverage in existing buildings. Existing buildings that do not have *approved* radio coverage for emergency responders within the building shall be equipped with such coverage according to one of the following:

1. Whenever existing wired communication system cannot be repaired or is being replaced, or where not *approved* in accordance with Section 510.1 Exception 1.
2. Within a time frame established by the adopting authority.

~~**Exception:** Where it is determined by the fire code official that the radio coverage system is not needed.~~

(Portions of proposal not shown remain unchanged)

Commenter's Reason: Section 510, as modified by F27-09/10, clearly states that buildings shall have adequate radio coverage by naturally-available signal strengths, wired communication systems, or amplification systems. If the requirements and design options are clear, then under what circumstances would a fire code official determine that radio coverage is not needed in order to apply the exception to 510.1 and 510.2? This

exception would imply that the code requirement could arbitrarily be waived without contemplating the practical difficulties or alternate methods allowed in chapter 1. Such an exception is not found in any other IFC construction requirement such as fire sprinklers or fire alarms where the required thresholds and design options are similarly clear. Therefore, it is recommended that the exceptions be removed.

Public Comment 3:

Bob Eugene representing Underwriters Laboratories Inc, requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

510.4.1.2 Minimum signal strength out of the building. A minimum signal strength of ~~-400~~ -95 dBm shall be received by the agency's radio system when transmitted from within the building.

(Portions of the proposal not shown remain unchanged.)

Commenter's Reason: Section 24.5.2 of the 2010 edition NFPA 72 National Fire Alarm Code provides different outbound signal strength than specified in 510.4.1.2 as approved by the committee. For consistency, these two companion documents should adopt the same parameters.

Public Comment 4:

Bob Eugene representing Underwriters Laboratories Inc, requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

510.4.2.3 Secondary power. Emergency responder radio coverage systems shall be provided with an *approved* secondary source of power. The secondary power supply shall be capable of operating the emergency responder radio coverage system for a period of at least ~~42~~ 24 hours. When primary power is lost, the power supply to the emergency responder radio coverage system shall automatically transfer to the secondary power supply.

(Portions of the proposal not shown remain unchanged.)

Commenter's Reason: Emergency power shall be capable of operating at least 24 hours per NFPA 72 National Fire Alarm Code.

Public Comment 5:

Bob Eugene representing Underwriters Laboratories Inc, requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

510.4.2.4 Signal booster requirements. If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a NEMA4-type water proof cabinet.
2. Battery systems used for the emergency power source shall be contained in a NEMA4-type water proof cabinet.
3. The system shall include automatic alarming of malfunctions of the signal booster system and battery system. Any resulting trouble alarm shall be automatically transmitted to an approved central station or proprietary supervising station as defined in NFPA 72 shall be electrically supervised and monitored by a supervisory service, or when approved by the fire code official, shall sound an audible signal at a constantly attended location.
4. Equipment shall have FCC Certification prior to installation.

(Portions of the proposal not shown remain unchanged.)

Commenter's Reason: The existing text is restored and incorporated into Section 510.4.2.4. The original proposal as approved by the committee has the unfortunate consequence of being very vague regarding monitoring troubles off-site.

Public Comment 6:

Paul K. Heilstedt, PE, HonAIA, Chair, representing ICC Code Technology Committee (CTC) and Joe Pierce (Chairman), Dallas Fire Department, representing Joint Fire Service Review Committee, request Approval as Modified by this Public Comment.

Further modify the proposal as follows:

510.2 Emergency responder radio coverage in existing buildings. Existing buildings shall be provided with *approved* radio coverage for emergency responders as required in Chapter 46.

~~4603.2~~ 510.2 Emergency responder radio coverage in existing buildings. Existing buildings that do not have *approved* radio coverage for emergency responders within the building shall be equipped with such coverage according to one of the following:

1. Whenever existing wired communication system cannot be repaired or is being replaced, or where not *approved* in accordance with Section 510.1 Exception 1.
2. Within a time frame established by the adopting authority.

Exception: Where it is determined by the *fire code official* that the radio coverage system is not needed.

510.5.1 Approval prior to installation. ~~No~~ Amplification systems capable of operating on frequencies licensed to any public safety agency by the FCC shall not be installed without prior coordination and approval of the *fire code official*.

510.5.3 Minimum qualifications of personnel. The minimum qualifications of the system designer and lead installation personnel shall include:

1. A Valid FCC issued General Radio Operators License, and
2. Certification of in-building system training issued by a nationally recognized organization, school or a certificate issued by the manufacturer of the equipment being installed.

~~The agency may waive~~ These ~~requirements~~ qualifications shall not be required where upon successful demonstration of adequate skills and experience satisfactory to the *fire code official* is provided.

510.5.4 Acceptance test procedure. When an emergency responder radio coverage system is required, and upon completion of installation, the building *owner* shall have the radio system tested to ensure that two-way coverage on each floor of the building is a minimum of 90 percent. The test procedure shall be conducted as follows:

1. Each floor of the building shall be divided into a grid of 20 approximately equal test areas.
2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system.
3. ~~Failure of a maximum of two nonadjacent test areas will be allowed to fail the test shall not result in failure of the test.~~
4. In the event that three of the test areas fail the test, in order to be more statistically accurate, the floor ~~may~~ shall be permitted to be divided into 40 equal test areas. ~~Failure of a maximum of four nonadjacent test areas will be allowed to fail the test shall not result in failure of the test.~~ If the system fails the 40-area test, the system shall be altered to meet the 90 percent coverage requirement.
5. A test location approximately in the center of each ~~grid test area will~~ shall be selected for the test, ~~then with the radio will be enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire test area. If the test fails Failure in the selected test location shall be considered failure of that grid test area shall fail, and prospecting for a better spot within the grid area will not be allowed. Additional test locations shall not be permitted.~~
6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building owner ~~will be required shall~~ to rerun the acceptance test to reestablish the gain values.
7. As part of the installation a spectrum analyzer or other suitable test equipment shall be utilized to insure spurious oscillations are not being generated by the subject signal booster. This test ~~will~~ shall be conducted at time of installation and subsequent annual inspections.

Commenter's Reason: This language originated with code change F87-07/08 last cycle for which the CTC was a co-proponent of the public comment with the Joint Fire Service Review committee. As part of the appendix, this text required the adopting entity to review the language for consideration as a set of mandatory requirements. With the relocation into the body of the code, it is important that all such text be compiled in mandatory, enforceable language. This Public Comment proposes such revisions as editorial.

Additionally, in Section 510.2 the language is relocated in to Chapter 46 to be consistent with the other portions of the IFC. All construction requirements applicable to existing buildings have been compiled in Chapter 46. This is simply an editorial revision to format these requirements in the style of the IFC.

Public Comment 7:

Jeffrey Shapiro, P.E., International Code Consultants, representing National Multi Housing Council, requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

510.2 Emergency responder radio coverage in existing buildings. Existing buildings that do not have *approved* radio coverage for emergency responders within the building, based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building, shall be equipped with such coverage according to one of the following:

1. Whenever existing wired communication system cannot be repaired or is being replaced, or where not *approved* in accordance with Section 510.1 Exception 1.
2. Within a time frame established by the adopting authority.

Exception: Where it is determined by the *fire code official* that the radio coverage system is not needed.

(Portions of the proposal not shown remain unchanged.)

Commenter's Reason: The text that is recommended for inclusion in Section 510.2 is currently included in 510.1. In that location, it previously applied to both new and existing buildings. When the section was reformatted by this proposal to split new and existing buildings into two sections, the text was mistakenly omitted from 510.2, unintentionally changing the requirement. Including this text is necessary so that there is a basis of judging the adequacy of the existing radio coverage, and it maintains the existing requirement since there was no apparent intent to delete it.

Final Action: AS AM AMPC _____ D

Proposed Change as Submitted

Proponent: Ronald Marts, Telecordia, Qwest Communications, AT&T

Revise as follows:

510.1 Emergency responder radio coverage in buildings. All buildings shall have *approved* radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the building official and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained in lieu of an *approved* radio coverage system.
2. Where it is determined by the *fire code official* that the radio coverage system is not needed.
3. In telecommunications buildings, where emergency responder radio coverage is required and such systems, components or equipment required may have a negative impact of radio frequency interference (RFI) on local, regional and/or national telecommunications functions of the facility, it shall be permitted to provide a function switch for the activation of the internal emergency responder radio system. The location of the function switch shall be approved by the fire code official.

Reason: This specific activation of the facilities internal emergency responder radio system will limit potential inference with the vital telecommunications operations of the facility to 24/7 exposure to these signals. The potential for interference with the operations of the telecommunications facility operations is unique to each space and operation of the facility and places in direct risk emergency services, national security and defense, and other critical telecommunications functions of the facility.

To date, studies have suggested that RFI from these transmitters may affect telecommunications equipment and thus telecommunications service.

Cost Impact: The code change proposal will have a small impact on construction cost

ICCFILENAME: MARTS-F1-510.1.DOC

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt that exempting a specific type of facility could set up a future trend toward a "laundry list" of facilities that wish to be exempt from the requirement. It also felt that the existing exceptions, reasonably applied, could remedy any such concerns and that IFC Section 104.9 could also be applied. The committee also felt that providing an "on-off" switch for the radio coverage system could place first responders in danger.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Ronald Marts representing Telcordia Technologies, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

510.1 Emergency responder radio coverage in buildings. All buildings shall have *approved* radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the building official and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained in lieu of an *approved* radio coverage system.
2. Where it is determined by the *fire code official* that the radio coverage system is not needed.
3. ~~In telecommunications buildings, where emergency responder radio coverage is required and such systems, components or equipment required may have a negative impact of radio frequency interference (RFI) on local, regional and/or national~~

~~telecommunications functions of the facility, it shall be permitted to provide a function switch for the activation of the internal emergency responder radio system. The location of the function switch shall be approved by the fire code official.~~
In facilities where emergency responder radio coverage is required and such systems, components or equipment required may have a negative impact on the normal operations of that facility, the fire code official shall have the authority to accept an automatically activated responder system.

Commenter's Reason: Some facilities, such as telecommunications central offices have equipment that may be affected by the radio frequency interference (RFI) of responder radio equipment. Having the emergency responder radio equipment off until needed rectifies the expected interference. The fire official and the building owner can decide on the automatic means of activating the responder system. To date, studies have suggested that RFI from these transmitters may affect telecommunications equipment and thus telecommunications service to the community, including 911 calls.

Cost Impact: The code change proposal will have a small impact on construction cost.

Final Action: AS AM AMPC____ D
