Adhoc Health Committee Report – Fire/Fire Safety Group A changes:

There are 4 areas of study currently listed under Adhoc .

1. Fire/Fire Safety
2. General
3. Means of Egress
4. Occupancy

Following are code change proposals submitted through Adhoc Health from Fire/Fire Safety and related changes.

Fire/Fire Safety

Code Change #	Section	Adhoc (x) or Related (o)	Position					Comments
			Oppose & Testify	Oppose	No Position	Support	Support & Testify	
FS37	709.4	O						
FS38	709.4	O						
FS39	709.4	O						
FS40	709.5	o						Corridor doors in Group I-2 and ACFs
FS041	710	o						
FS042	710.4	x						Smoke partition continuity
FS48	711.9	o						Smoke barriers
FS49	711.9	o						Smoke barriers
FS56	713.3	o						Chutes - NFPA 82
FS072	714.2	o						Certified Firestop Contractors - Group I-2
FS78	715.2	o						Certified FR Joint Contractors - Group I-2
FS114	717.5.5	x						
G054	404.6	x						Atrium enclosure in I-2
G055	404.6	o						
G077	407.9	o						EM Power in Group I-2 Hosp & NH
G130	509	x						See G32
M036	401.2	x						

FS37 – 12
709.4

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

709.4 Continuity. *Smoke barriers* shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required *fire-resistance rating* of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction.

Exceptions:

1. Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.
2. Smoke barriers used ~~for~~ to enclose elevator lobbies in accordance with Section 405.4.3, 1007.6.2, 3007.7.2 or 3008.7.2 shall be permitted to terminate at the elevator hoistway shaft enclosure. ~~not required to extend from outside wall to outside wall.~~ A smoke and draft control door assembly as specified in Section 716.5.3.1 shall not be required at each elevator hoistway door opening.
3. Smoke barriers used for areas of refuge in accordance with Section 1007.6.2 are not required to extend from outside wall to outside wall.

Reason: This proposal is one of several proposals submitted by the CTC dealing with elevator lobbies. The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. Note that this subject had been previously addressed by CABO/BCMC in 1986 with a similar conclusion. The code change proposals submitted are the result of the CTC's study of the issue. Note that the scope of the activity was as follows:

Scope

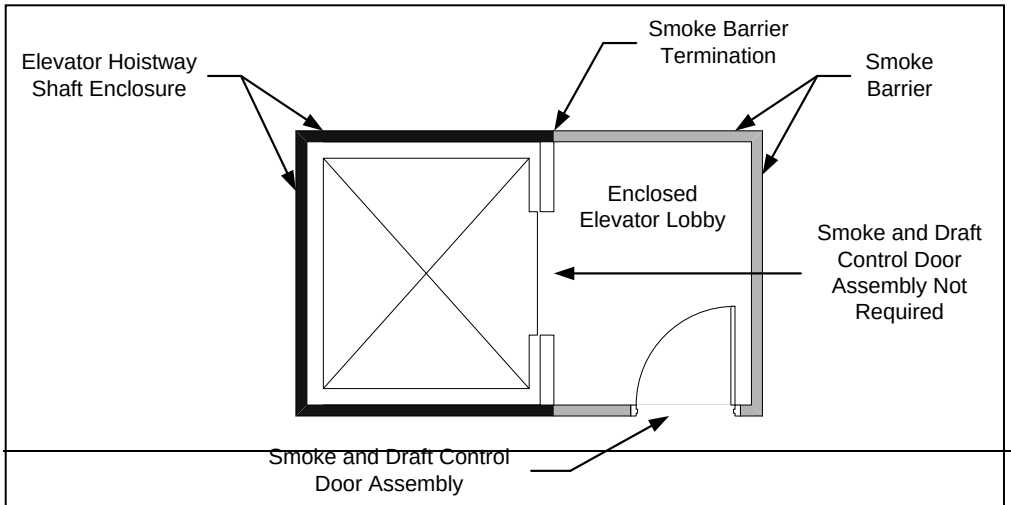
- ☐ Review the need for elevator lobbies~~,~~ with emphasis on building use, building and hoistway height, active and passive fire protection features associated with the aforementioned.
- ☐ Review the differences and specific needs when dealing with elevator lobbies of traditional-use elevators, fire service elevators, and occupant evacuation elevators.
- ☐ Review related code provisions, such as egress from and through elevator lobbies.
- ☐ Review the appropriate use of alternatives including pressurization of hoistways, additional doors, roll-down style barriers, and gasketing systems.
- ☐ Review with members of elevator industry to scope the requirements of applicable elevator reference standards as it deals with elevator lobby design, use and construction.
- ☐ Review design and construction requirements for elevator lobbies, including but not limited to dimensions, location and separation.
- ☐ Review applicable code change history, technical studies and loss statistics as part of this review.

Based upon the extensive nature of this area of study**,** 5 Task Groups were formed during the process to provide in-depth review and to manage the number of issues. These task groups developed a number of proposals that were coordinated throughout the process.

More information on this CTC area of study can be found at the following link.
http://www.iccsafe.org/cs/CTC/Pages/ElevatorLobbies.aspx

This proposal provides clarification of the smoke barrier continuity requirements. Provisions are necessary to clarify that opening protection at the hoistway opening is not necessary when an enclosed elevator lobby is provided in accordance with Section 405.4.3, 3007.7.2, or 3008.7.2. An enclosed elevator lobby protects the hoistway from smoke migration, therefore the hoistway is already protected. In addition the shaft walls provide sufficient smoke and draft protection to allow the smoke barriers to terminate at those walls.

This proposal does not require correlation with other CTC Elevator Lobby SG lobby proposals. See discussion on CTC elevator lobby proposal coordination in code change FS##-12



SEC 709.4, EXCEPTION 2 - SMOKE BARRIER TERMINATION AT ELEVATOR HOISTWAY SHAFT ENCLOSURE

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

Analysis: FS37, FS38 and FS39 provide different requirements for smoke barriers enclosing elevator lobbies. The committee needs to make its intent clear with respect to these provisions.

FS37-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

709.4-FS-Baldassarra-CTC

FS38 – 12
709.4

Proponent: Douglas H. Evans, P.E., Clark County Building, representing Southern Nevada Chapter ICC (DHE@ClarkCountyNV.gov)

Revise as follows:

709.4 Continuity. *Smoke barriers* shall form an effective membrane continuous ~~from outside wall to outside wall and~~ from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required *fire-resistance rating* of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction.

Exceptions:

1. ~~1.~~ Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.
2. ~~*2. Smoke barriers* used for elevator lobbies in accordance with Section 405.4.3, 3007.4.2 or 3008.11.2 are not required to extend from outside wall to outside wall.~~
3. ~~*3. Smoke barriers* used for areas of refuge in accordance with Section 1007.6.2 are not required to extend from outside wall to outside wall.~~

Reason: Requiring smoke barrier walls to be continuous from outside wall to outside wall can prove to be impractical in many applications. Many smoke control system employ passive smoke barriers as well as pressurization method zones that are wholly within a building where the smoke boundary walls do not intersect with the outside walls. The code requires smoke control systems for atria, underground buildings, Group I occupancies and covered malls. Requiring the smoke barrier wall to extend from outside wall to outside wall restricts the designer to certain parameters and limits the design of the building. In the instance of an atrium, if located within the center core of a building, requiring a fire-resistance rated separation to extend from outside wall to outside wall adds additional rated separations that are simply not needed when a smoke barrier wall around the atrium would meet the intent of the code by adequately separating the atrium from the balance of the facility. Underground buildings require compartmentation and therefore smoke barrier construction may be considered as redundant and unnecessary. Covered malls may be designed, and often are designed, as one large smoke zone, thereby eliminating the need for smoke barrier construction. The use of an outside wall is not required to make the system functional and provides no additional benefit.

Cost impact: None

Analysis: FS37, FS38 and FS39 provide different requirements for smoke barriers enclosing elevator lobbies. The committee needs to make its intent clear with respect to these provisions.

FS38-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS39 – 12
709.4

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

Revise as follows:

709.4 Continuity. Smoke barriers shall form an effective membrane continuous ~~from outside wall to outside wall and~~ from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction for a smoke barrier shall be protected to afford the required fire-resistance rating of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction. Smoke barrier walls used to separate smoke compartments shall comply with Section 709.4.2. Smoke barrier walls used to enclose areas of refuge in accordance with Section 1007.6.2 or to enclose elevator lobbies in accordance with Section 405.4.3, 3007.7.2, or 3008.7.2 shall comply with Section 709.4.3.

Exceptions:

1. Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.
2. ~~Smoke barriers used for elevator lobbies in accordance with Section 405.4.3, 3007.4.2 or 3008.11.2 are not required to extend from outside wall to outside wall.~~
3. ~~Smoke barriers used for areas of refuge in accordance with Section 1007.6.2 are not required to extend from outside wall to outside wall.~~

709.4.2 Smoke barrier walls separating smoke compartments. Smoke barrier walls used to separate smoke compartments shall form an effective membrane continuous from outside wall to outside wall.

709.4.3 Smoke barrier walls enclosing areas of refuge or elevator lobbies. Smoke barrier walls used to enclose areas of areas of refuge in accordance with Section 1007.6.2, or elevator lobbies in accordance with Section 405.4.3, 3007.7.2, or 3008.7.2, shall form an effective membrane enclosure that terminates at a smoke barrier wall or fire barrier wall having a level of fire protection rating not less than 1-hour.

Reason: The intent of this code change proposal is to provide clarification to ensure that the area of refuge and the specific enclosed elevator lobbies are designed to minimize any potential intrusion of smoke. In addition, the proposed new text ensures that the termination wall of the smoke barrier will have a fire resistance rating equivalent to the fire resistance rating of the required smoke barrier. Also, the reference to sections 3007.4.2 and 3008.11.2 was also editorially corrected.

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

Analysis: FS37, FS38 and FS39 provide different requirements for smoke barriers enclosing elevator lobbies. The committee needs to make its intent clear with respect to these provisions.

FS39-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS40 – 12
709.5, 709.5.1 (New)

Proponent: William E. Koffel, P.E., Koffel Associates, Inc. (wkoffel@koffel.com)

Revise as follows:

709.5 Openings. Openings in a smoke barrier shall be protected in accordance with Section 716.

Exceptions:

1. In Group I-2 and ambulatory care facilities, where ~~doors are installed across *corridors*,~~ a pair of opposite-swinging doors are installed across a corridor in accordance with Section 709.5.1, the doors shall ~~not~~ be required to be protected in accordance with Section 716. ~~without a center mullion shall be installed having have vision panels with fire-protection-rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested.~~ The doors shall be close fitting within operational tolerances, and shall not have a center mullion or undercuts in excess of $^{3}/_{4}$-inch, louvers or grilles. The doors shall have head and jamb stops, and astragals or rabbets at meeting edges. ~~and shall be automatic-closing by smoke detection in accordance with Section 716.5.9.3.~~ Where permitted by the door manufacturer's listing, positive-latching devices are not required.
2. In Group I-2 and ambulatory care facilities, horizontal sliding doors installed in accordance with Section 1008.1.4.3 and protected in accordance with Section 716.

709.5.1 Group I-2 and ambulatory care facilities. In Group I-2 and ambulatory care facilities, where doors are installed across a corridor, the doors shall be automatic closing by smoke detection in accordance with Section 716.5.9.3 and shall have a vision panel with fire-protection rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested.

Reason: The first exception has been revised to clarify that it only applies when swinging doors are installed and does not require the use of swinging doors. Adding the second exception in the 2009 Edition helped with this issue but the proposed language is submitted for additional clarity.

The requirements for automatic closing doors and a vision panel have been removed from the first exception and added as a specific requirement. The Code should require the vision panel in both swinging and horizontal sliding doors. The purpose of the vision panel is to allow one to see if someone is in closing proximity to the door (applies only to swinging doors) and to allow the staff to check conditions on the other side of the door prior to opening the door. Both swinging doors and horizontal sliding doors, when installed across a corridor, are to be automatic-closing. Both of these requirements currently apply to such facilities due to licensure, certification, and accreditation requirements.

Cost Impact: None

FS40-12

Public Hearing: Committee:	AS	AM	D	
Assembly:	ASF	AMF	DF	

FS41 – 12
404.6, 710.1, 710.5.2, 710.5.2.1, 710.5.2.2, 710.5.2.3, 713.14.1

Proponent: Joe Pierce, Dallas Fire Department, TX, representing the ICC Fire Code Action Committee

Revise as follows:

404.6 Enclosure of atriums. Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier constructed in accordance with Section 707 or a horizontal assembly constructed in accordance with Section 711, or both.

Exception: A fire barrier is not required where a glass wall forming a smoke partition is provided. The glass wall shall comply with all of the following:

1. Automatic sprinklers are provided along both sides of the separation wall and doors, or on the room side only if there is not a walkway on the atrium side. The sprinklers shall be located between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and at intervals along the glass not greater than 6 feet (1829 mm). The sprinkler system shall be designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction;
   1.1. The glass wall shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the sprinkler system operates; and
   1.2. Where glass doors are provided in the glass wall, they shall be either self-closing or automatic-closing <u>upon detection of smoke in accordance with Section 716.5.9.3</u>.
2. A fire barrier is not required where a glass-block wall assembly complying with Section 2110 and having a 3/4-hour fire protection rating is provided.
3. A fire barrier is not required between the atrium and the adjoining spaces of any three floors of the atrium provided such spaces are accounted for in the design of the smoke control system.

Revise as follows:

SECTION 710
SMOKE PARTITIONS

710.1 General. ~~Smoke partitions installed as required elsewhere in the code shall comply with this section.~~ <u>The following wall assemblies shall comply with this section:</u>

1. <u>Walls separating atrium spaces as required by Section 404.6 Exception #1.</u>
2. <u>Group I-2 corridor walls as required by Section 407.3.</u>
3. <u>Group I-2 care suite separations as required by Section 407.4.3.2.</u>
4. <u>Elevator lobby walls as required by Section 713.14.1 Exception #5.</u>

~~**710.5.2 Doors.** Doors in smoke partitions shall comply with Sections 710.5.2.1 through 710.5.2.3.~~

710.5.2.~~1~~ Louvers <u>in Doors</u>. Doors in smoke partitions shall not include louvers.

~~**710.5.2.2 Smoke and draft control doors.** Where required elsewhere in the code, doors in smoke partitions shall meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.015424 m3/(s • m2)) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature test and the elevated temperature exposure test. Installation of smoke doors shall be in accordance with NFPA 105.~~

~~**710.5.2.3 Self- or automatic-closing doors.** Where required elsewhere in the code, doors in smoke partitions shall be self- or automatic-closing by smoke detection in accordance with Section 716.5.9.3.~~

713.14.1 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 in Section 708 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 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 717.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the level(s) of exit discharge, provided the level(s) of exit discharge is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 712.1 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
   4.1. Group I-2 occupancies;
   4.2. Group I-3 occupancies; and
   4.3. Elevators serving floor levels over 75 feet (22 860 mm) above the lowest level of fire department vehicle access in high-rise buildings.
5. Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. ~~In addition to the requirements in Section 710 for smoke partitions, doors~~ Doors protecting openings in the smoke partitions shall be self- or automatic-closing upon detection of smoke in accordance with Section 716.5.9.3 and also comply with Section~~s 710.5.2.2~~ 716.5.3.1., ~~710.5.2.3, and 716.5.9 and duct~~ Duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 909.21.
7. Enclosed elevator lobbies are not required where the elevator serves only open parking garages in accordance with Section 406.5.

Reason: The intent of this proposal is to format the requirements for smoke partitions to clarify the application of the various features of smoke partitions.

Smoke partitions are required in only 4 sections of the code. Those sections are 404.6, 407.3, 407.4.3.2 and 713.14.1.

Section 710.1 is revised to list the 4 sections rather than state “elsewhere in the code” and then expect the code user to go find the sections.

Section 710.5.2.2 is deleted. Elevator lobbies are the only locations where smoke control doors are required. Since this is the only section where smoke control doors are required, rather than state “elsewhere in the code” it is clearer to revise Section 713.14.1 to contain the requirements and make reference directly to Section 716.5.9.3.

Section 710.5.2.3 is also deleted. Since doors in smoke partitions in elevator lobbies are handled in the revision to Section 713.4.1, there are only two sections which meet the “elsewhere in the code” criteria. The Sections are 404.6 and 407.3.1. Section 407.3.1 already makes the requirement for corridor walls in Group I-2. A minor revision to Section 404.6 and a reference directly to Section 716.5.9.3 covers the issue.

Within all of these revisions, the code requirements remain the same; the proposal does not change the current technical requirements in the code. Most importantly, Section 710 is simplified, and the occupancy or use specific requirements are located with other requirements for those occupancies and uses.

Section 710.3 was not revised since a smoke partition may be required to have a fire-resistance rating such as with a fire barrier or a horizontal assembly. In these cases, the design profession will need to comply with the other provisions in IBC Chapter 7 as well as the requirements for smoke partitions.

NOTE: The table below lists every subsection of 710 in the left column and the four locations where smoke partitions are required in the header. Each specific requirement is identified as either applying to those specific sections, or revisions are suggested to correlate the code requirements. The revisions shown in the table are the same revisions contained in this proposal, but you can see how each section was reviewed and evaluated.

Smoke Partition requirements in Section 710 with proposed revisions	**Where smoke partitions are required under the IBC**				**Comments**
	404.6 Exception: For Atrium enclosure	**407.3: I-2 corridor wall construction**	**407.4.3.2: I-2 care suite separation**	**713.14.1 Exception #5: Elevator lobby**	
710.1 General. ~~Smoke partitions installed as required elsewhere in the code shall comply with this section.~~ The following wall assemblies shall comply with this section: 1. Walls separating atrium spaces as required by Section 404.6 Exception #1 2. Group I-2 corridor walls as required by Section 407.3. 3. Group I-2 care suite separations as required by Section 407.4.3.2. 4. Elevator lobby walls as required by Section 713.14.1 Exception #5.	✓	✓	✓	✓	Revision Section 710.1 to identify where smoke partitions are used. This revision makes Section 710.1 user-friendly and clarifies where the 4 locations in the Code smoke partitions are required. Similar to existing Section 708.1 format that is for fire partitions.
710.2 Materials. The walls shall be of materials permitted by the building type of construction.	✓	✓	✓	✓	
710.3 Fire-resistance rating. Unless required elsewhere in the code, s partitions are not required to have a *fire-resistance rating*.	Non-fire rated	Non-fire rated	Non-fire rated	Non-fire rated	Smoke partitions are designed to resist the passage of smoke. If a wall that is a smoke partition is also required to be a fire partition or fire barrier, then it would need to comply with both requirements.
710.4 Continuity. Smoke partitions shall extend from the top of the foundation or floor below to the underside of the floor or roof sheathing, deck or slab above or to the underside of the ceiling above where the ceiling membrane is constructed to limit the transfer of smoke.	✓	✓	✓	✓	

Smoke Partition requirements in Section 710 with proposed revisions	Where smoke partitions are required under the IBC				Comments
	404.6 Exception: For Atrium enclosure	**407.3: I-2 corridor wall construction**	**407.4.3.2: I-2 care suite separation**	**713.14.1 Exception #5: Elevator lobby**	
710.5 Openings. Openings in smoke partitions shall comply with Sections 710.5.1 and 710.5.2.	Only a pointer section to requirements in following subsections	Only a pointer section to requirements in following subsections	Only a pointer section to requirements in following subsections	Only a pointer section to requirements in following subsections	
710.5.1 Windows. Windows in smoke partitions shall be sealed to resist the free passage of smoke or be automatic-closing upon detection of smoke.	✓	✓	✓	✓	
~~**710.5.2 Doors.** Doors in smoke partitions shall comply with Sections 710.5.2.1 through 710.5.2.3.~~	Only a pointer section to requirements in following subsections	Only a pointer section to requirements in following subsections	Only a pointer section to requirements in following subsections	Only a pointer section to requirements in following subsections	No longer needed since the requirements under Sections 710.5.2.2 & 710.5.2.3 are placed directly into the sections of Code that use these requirements. See Comments below.
710.5.2.~~1~~ Louvers <u>in Doors</u>. Doors in smoke partitions shall not include louvers.	✓	✓	✓	✓	Revised code section since Section 710.5.2 was not needed as a pointer if Sections 710.5.2.2 & 710.5.2.3 will be placed directly in the two places where the code requirements is actually required. See Comments below.

Smoke Partition requirements in Section 710 with proposed revisions	Where smoke partitions are required under the IBC				Comments
	404.6 Exception: For Atrium enclosure	407.3: I-2 corridor wall construction	407.4.3.2: I-2 care suite separation	713.14.1 Exception #5: Elevator lobby	
~~**710.5.2.2 Smoke and draft control doors.** Where required elsewhere in the code, doors in smoke partitions shall meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.015424 m3/(s • m2)) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature test and the elevated temperature exposure test. Installation of smoke doors shall be in accordance with NFPA 105.~~	**Not Required**	**Not Required**	**Not Required**	✓ **713.14.1 Elevator lobby. Exceptions:** 5. Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. ~~In addition to the requirements in Section 710 for smoke partitions,~~ ~~d~~Doors protecting openings in these walls ~~smoke partitions~~ shall be self- or automatic-closing upon detection of smoke in accordance with Section 716.5.9.3 and also comply with Sections ~~710.5.2.2~~ 716.5.3.1., ~~710.5.2.3, and 716.5.9 and~~ ~~d~~Duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 717.5.4.1.	Since on the elevator lobby exception requires smoke control doors, directly reference this requirement in Section 713.14.1 Exception #5 to Section 716.5.3.1 that is the same wording and requirement for "opening protectives" In addition, instead of referencing Sections 710.5.2.3 and 716.5.9, go directly to the requirement for self or automatic closing doors in Section 716.5.9.3.

Smoke Partition requirements in Section 710 with proposed revisions	Where smoke partitions are required under the IBC				Comments
	404.6 Exception: For Atrium enclosure	**407.3: I-2 corridor wall construction**	**407.4.3.2: I-2 care suite separation**	**713.14.1 Exception #5: Elevator lobby**	
~~**710.5.2.3 Self- or automatic-closing doors.**~~ ~~Where required elsewhere in the code, doors in smoke partitions shall be self- or automatic-closing by smoke detection in accordance with Section 716.5.9.3.~~	✓ **404.6 Exceptions:** A *fire barrier* is not required where a glass wall forming a smoke partition is provided. The glass wall shall comply with all of the following: 1.2. Where glass doors are provided in the glass wall, they shall be either *self-closing* or automatic closing upon detection of smoke in accordance with Section 716.5.9.3.	**Not needed. Already covered by Section 407.3.1: 407.3.1 Corridor doors.** Corridor doors, other than those in a wall required to be rated by Section 509.4 or for the enclosure of a vertical opening or an exit, shall not have a required fire protection rating and shall not be required to be equipped with self-closing or automatic-closing devices, but shall provide an effective barrier to limit the transfer of smoke and shall be equipped with positive latching. Roller latches are not permitted. Other doors shall conform to Section 716.5.	**Not Required**	✓ **See recommended revision to Exception #5 above and the comment.**	For the two places in the Code that require the self or automatic closing doors for its smoke partitions it is more user friendly and more direct just to incorporate the reference to Section 716.5.9.3 for the atrium and elevator exceptions then to go through Section 710.5.2.3 to get to Section 716.5.9.3.
710.6 Penetrations. The space around penetrating items shall be filled with an *approved* material to limit the free passage of smoke.	✓	✓	✓	✓	
710.7 Joints. Joints shall be filled with an *approved* material to limit the free passage of smoke.	✓	✓	✓	✓	

Smoke Partition requirements in Section 710 with proposed revisions	Where smoke partitions are required under the IBC				Comments
	404.6 Exception: For Atrium enclosure	407.3: I-2 corridor wall construction	407.4.3.2: I-2 care suite separation	713.14.1 Exception #5: Elevator lobby	
710.8 Ducts and air transfer openings. The space around a duct penetrating a smoke partition shall be filled with an *approved* material to limit the free passage of smoke. Air transfer openings in smoke partitions shall be provided with a *smoke damper* complying with Section 717.3.2.2. **Exception:** Where the installation of a *smoke damper* will interfere with the operation of a required smoke control system in accordance with Section 909, *approved* alternative protection shall be utilized.	✓	✓	✓	✓	

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

FS41-12

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

710-FS-PIERCE-FCAC

FS42 – 12
710.4

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Healthcare

Revise as follows:

710.4 Continuity. Smoke partitions shall extend from the top of the foundation or floor below to the underside of the floor or roof sheathing, deck or slab above or to the underside of the ceiling above where the ceiling membrane is constructed to limit the transfer of smoke. A lay-in ceiling system that is designed to limit the transfer of smoke shall be permitted. Hold-down clips for such ceilings shall not be required where the ceiling tiles will resist an uplifting force of at least one pound per square foot of tile.

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx

Current interpretation of an allowable ceiling system is to be "monolithic." This type of ceiling is not feasible in a hospital setting, because main utility and ductwork lines run in the corridor to keep them out of patient care areas. This would facilitate the need for many access panels which compromise the smoke tight nature of the monolithic ceiling. The construction of the lay-in system would basically mean no open portions or gaps in the ceiling, either as an architectural feature or between items such as louvers. Normal ceiling fixtures such as lights, sprinkler heads, and diffusers and grills (as part of a fully ducted air system) can be considered part of the smoke tight system, as there is no opportunity for smoke to travel straight through them. A tight fitting lay-in grid is defined as one with no gaps in them, which is easily enforced via visual inspection and is therefore simply maintained.

The one pound per square foot weight can handle an updraft concerns because a facility equipped with QRS sprinklers will not generate enough heat to cause the updraft to move the tile. Hold-down clips in this instance would not be necessary, as the weight of the tile itself would be sufficient. Due to the need for access to above ceiling utilities, hold-down clips would interfere with maintenance and operations, which is why an updraft limitation is considered.

Since a fully ducted air handling system is required in the I-2 hospital occupancy, plenum ceilings that compromise the ceiling system are already prohibited.

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

FS42-12

Public Hearing:	Committee:	AS	AM	D	
	Assembly:	ASF	AMF	DF	

FS48 – 12
711.9

Proponent: Al Godwin, CBO, CPM, representing Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

711.9 Smoke barrier. Where *horizontal assemblies* are required to resist the movement of smoke by other sections of this code in accordance with the definition of *smoke barrier*, penetrations and joints in such *horizontal assemblies* shall be protected as required for *smoke barriers* in accordance with Sections 714.5 and 715.6. ~~Regardless of the number of *stories* connected by elevator shaft enclosures, doors located in elevator shaft enclosures that penetrate the *horizontal assembly* shall be protected by enclosed elevator lobbies complying with Section 713.14.1.~~ Openings through *horizontal assemblies* shall be protected by shaft enclosures complying with Section 713. *Horizontal assemblies* shall not be allowed to have unprotected vertical openings.

Reason: This provision was added in the 2009 IBC under code change FS81-07/08. However, it is unclear if it overrides the exceptions of Section 713.14.1 associated with elevator lobbies.

The question that has to be asked is

"Do the Exceptions of Section 713.14.1 still apply?"

If the exceptions do <u>not</u> apply, then this one sentence overrules everything that has been built into the elevator lobby provisions over the past few years for occupancies with smoke barriers, such as I-2's or ambulatory health care. And, no justification was presented.

Does this mean that:

1. all uses with a smoke barrier should not be allowed to exempt the ground floor from the elevator lobby provision of exception 1?
2. that the smoke partition option of exception 5 does not work?
3. that pressurization does not work?

If the exceptions <u>do</u> apply, then given that lobbies are only required when connecting more than 3 floors and with exception 4, the only buildings that this provision would apply to is:

1. two and three story non-sprinklered buildings with smoke barriers, and there shouldn't be any; and,
2. two and three story Group I-2 buildings.

What justification has been presented to show that these buildings are a problem?

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

Analysis: FS47 revises provisions for in elevator shaft enclosures. FS48 and FS49 delete these provisions. The committee needs to make its intent clear with respect to these provisions.

FS48-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS49 – 12
711.9

Proponent: Sarah A. Rice, C.B.O., representing The Preview Group (srice@preview-group.com)

Revise as follows:

711.9 Smoke barrier. Where horizontal assemblies are required to resist the movement of smoke by other sections of this code in accordance with the definition of smoke barrier, penetrations and joints in such horizontal assemblies shall be protected as required for smoke barriers in accordance with Sections 709 ~~714.5 and 715.6. Regardless of the number of stories connected by elevator shaft enclosures, doors located in elevator shaft enclosures that penetrate the horizontal assembly shall be protected by enclosed elevator lobbies complying with Section 713.14.1. Openings through horizontal assemblies shall be protected by shaft enclosures complying with Section 713. Horizontal assemblies shall not be allowed to have unprotected vertical openings.~~

Reason: The current language of Section 711.9 contains provisions that are misplaced and are contradictory to other provisions in the IBC. In the Reason statement for the code change which brought this language into the code (FS81-07/08) the proponent states that "This code change proposal is intended to clarify the requirements for horizontal assemblies that are used to support smoke barrier walls such as in Group I-2 occupancies where smoke barriers are required to subdivide floors by Section 407.4." But Section 407.4 is NOT the only place in the code where smoke barriers are required, they are required also in Group I-3 occupancies.

When taken literally, the last 2 sentences totally negate the provisions found in Section 709; Smoke Barriers, and specifically the provisions found in Sections 709.5 through 709.8 which were developed to address openings, penetrations, joints and duct openings in smoke barriers – both vertical and horizontal. When looking at each of the individual sections, you find that there are multiple places where openings through horizontal assemblies are permitted to be protected by something other than a shaft enclosure.

This proposal seeks to remove the confusing language in Section 711.9 and rely rather on a simple reference to Section 709; Smoke Barriers which contains the provisions for addressing any "holes" made to smoke barriers.

2012 IBC 709.5 Openings. Openings in a smoke barrier shall be protected in accordance with Section 716.

Exceptions:

1. In Group I-2 and ambulatory care facilities, where doors are installed across corridors, a pair of opposite-swinging doors without a center mullion shall be installed having vision panels with fire-protection-rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested. The doors shall be close fitting within operational tolerances, and shall not have undercuts in excess of 3/4-inch, louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic-closing by smoke detection in accordance with Section 716.5.9.3. Where permitted by the door manufacturer's listing, positive-latching devices are not required.
2. In Group I-2 and ambulatory care facilities, horizontal sliding doors installed in accordance with Section 1008.1.4.3 and protected in accordance with Section 716.

709.6 Penetrations. Penetrations of smoke barriers shall comply with Section 714.
709.7 Joints. Joints made in or between smoke barriers shall comply with Section 715.
709.8 Ducts and air transfer openings. Penetrations in a smoke barrier by ducts and air transfer openings shall comply with Section 717.

Noticeably absent from the proponents Reason statement was justification for the sentence "Regardless of the number of stories connected by elevator shaft enclosures, doors located in elevator shaft enclosures that penetrate the horizontal assembly shall be protected by enclosed elevator lobbies complying with Section 713.14.1." Due to the prolonged adoption of the 2009 I-Codes in many jurisdictions, it has only recently come to light the impact of this provision, which is buried deep in the horizontal assembly section. This provision, if it were to be deemed viable should not be in the Section 711 at all but in Section 713.4.1 Elevator Lobbies.

The provision buried in Section 711.9 mandates that "Regardless of the number of stories connected by elevator shaft enclosures, doors located in elevator shaft enclosures that penetrate the horizontal assembly shall be protected by enclosed elevator lobbies complying with Section 713.14.1." Depending upon how you read the sentence it could be interpreted to say that this provisions overrides the "more than three stories" threshold found in Section 713.4.1 for when an elevator lobby is required –

Section 713.4.1 reads: it reads "713.14.1 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 in Section 708 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 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 717.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code."

No technical justification was ever given to validate changing the threshold found in Section 713.4.1 for elevator lobbies. This change deletes the provision from Section 711.9 in its entirety. The CTC Elevator Study Group has been studying the entire elevator lobby issue. Any drastic changes to the thresholds should come from that group.

For information purposes, the following is the Reason statement to FS81-07/08 "It is clear from the definition for "smoke barrier" that a smoke barrier can be a horizontal assembly. Furthermore, in order to provide for the continuity of the smoke protection for smoke compartments created by vertical smoke barriers to provide for relative safe areas for horizontal movement of patients in a fire emergency, it follows that the floors supporting those smoke barrier walls should also be able to resist the passage or movement of smoke through the assembly to maintain the appropriate level of protection for the occupants. Generally, occupants of Group I-2 occupancies are moved into a smoke barrier that is away from the area where the fire occurred so that they can remain until further moved as necessary or until the fire has been extinguished by the responding fire department. The provisions contained in this code change proposal we believe will provide the equivalent level of smoke protection to that of the smoke barrier for the horizontal assemblies that support the smoke barriers."

Cost Impact: This proposal will not increase the cost of construction.

Analysis: FS47 revises provisions for in elevator shaft enclosures. FS48 and FS49 delete these provisions. The committee needs to make its intent clear with respect to these provisions.

FS49-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS56 – 12
713.13

Proponent: Robert Marshall, Contra Costa Fire Department, representing CalChiefs (rmars@cccfpd.org); Adria Paesani, Fountain Valley Fire Department, representing CalChiefs

Revise as follows:

713.13 Refuse and laundry chutes. Refuse, Recycling, and Laundry Chutes shall meet the requirements of NFPA 82 and 713.13.1 through 713.13.6.

Exceptions:

1. Chutes serving and contained within a single dwelling unit.
2. ~~Refuse and laundry chutes in Group I-2 shall comply with the provisions of NFPA 82, Chapter 5.~~

Reason: During the last code cycle, a code change was submitted and approved to add the use of NFPA 82 for trash and linen chutes in I-2 occupancies. There was a conflict between the IBC and other non-ICC regulations that created conflicts causing problems during the accreditation process. During the committee hearings, some committee members stated that it would be better to make the requirement to use NFPA 82 across the board to avoid confusion. This code change proposal does exactly that.

NFPA 82 is more robust than the current requirements found in the IBC, though several items in the IBC are more restrictive than NFPA 82, so those items remain.

Referenced Standards: NFPA 82, 2009 edition

Cost Impact: This will increase the cost of construction

FS56-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS72 – 12
714.2 (New)

Proponent: Renée R Jacobs, CHFM, CHC, Saint Luke's Health System

Revise as follows:

714.2 Contractor Qualifications. In buildings containing a Group I-2 occupancy, through-penetration firestop systems shall be installed by contractors qualified by UL, FM, or an approved agency.

Exception: Where the work is of a minor nature as approved by the building official.

(Renumber subsequent sections)

Reason: Proper design, installation, inspection, and maintenance of firestopping and fire-resistant joint systems are critical to fire and life safety in healthcare facilities. The life safety elements of healthcare facilities are critical to patient life and safety given that healthcare facilities defend-in-place in lieu of evacuate in the event of a fire. Accreditation entities surveying the life safety elements of healthcare facilities primarily focus on rated barriers and the integrity of the firestopping and joint installations within the rated barriers. The vast majority of findings by the accreditation surveyors are improperly installed UL systems and unsealed penetrations within the rated barriers, accounting for significant cost for corrections following a survey. Additionally, fire marshals are increasingly more educated in correct systems for different applications as well as proper installation, enforcing stricter compliance and increased extent of ramifications for non-compliance.

The extent of survey findings and deficiencies demonstrate a lack of knowledge of the correct systems and procedures for firestop and fire-resistive joint systems installation, which can be alleviated by requiring that all work be performed by a approved/qualified contractor.

The cost for corrections can be greatly reduced if the contractor is properly trained and approved/qualified. Initial construction costs remain the same for installation by an approved/qualified contractor, as the cost of approval/qualification is not substantial enough to pass along to the customer as a cost of the work. These costs can range from $6,000 to $10,000 for the initial audit and approximately $3,000 annually for ongoing audits by Underwriters Laboratories and Factory Mutual, less than many contractors would spend on bidding a sizable project, attending a trade show, entertaining or advertising. Since any firm is eligible to obtain FM Approved Firestop Contractor and/or UL Qualified Firestop Contractor, experience shows that the main factor, the cost, can be recovered through the benefits of improved processes and reduced errors on projects.

Given that the contractor's cost for obtaining FM Approved Firestop Contractor and/or UL Qualified Firestop Contractor is minimal, the real factor is the on-going cost of repairs for incorrect or improperly installed systems, which remains a financial burden to most healthcare facilities. Annual outlay of capital dollars for continual corrections and repairs is commonplace for most healthcare facilities and is rarely even considered in the initial construction process.

Requiring installation of UL Firestop systems by approved/qualified firestop contractors is consistent with other code requirements mandating installation by certified contractors of other life safety systems such as medical gas systems certification of contractors and/or installers. Approval or qualification programs administered by approved agencies such as FM Approvals and Underwriters Laboratories currently exist for contractors who install materials that become firestop systems. Any contractor (trade or specialty firestop contractor) installing fire-resistant joint systems can be approved or qualified to the programs administered by these agencies. The programs are similar to ISO 9000 that is used for the manufacturing environment, but adjusted for the construction environment. Successful completion verifies that the company has policies and procedures in place that are sufficient to control operations resulting in installations conforming to the listed firestop system.

Availability of approved/qualified contractors that can easily attain the certification exists in virtually every state. Whereas the proposal is for the 2015 Edition of the IBC, it is reasonable to anticipate that many more contractors will participate in the programs prior to adoption of the Code.

Cost Impact: None

FS72-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS78 – 12
715.2 (New)

Proponent: Renée R Jacobs, CHFM, CHC, Saint Luke's Health System

Revise as follows:

715.2 Contractor Qualifications. In buildings containing a Group I-2 occupancy, fire-resistant joint systems shall be installed by contractors qualified by UL, FM, or an approved agency.

Exception: Where the work is of a minor nature as approved by the building official.

(Renumber subsequent sections)

Reason: Proper design, installation, inspection, and maintenance of firestopping and fire-resistant joint systems are critical to fire and life safety in healthcare facilities. The life safety elements of healthcare facilities are critical to patient life and safety given that healthcare facilities defend-in-place in lieu of evacuate in the event of a fire. Accreditation entities surveying the life safety elements of healthcare facilities primarily focus on rated barriers and the integrity of the firestopping and joint installations within the rated barriers. The vast majority of findings by the accreditation surveyors are improperly installed UL systems and unsealed penetrations within the rated barriers, accounting for significant cost for corrections following a survey. Additionally, fire marshals are increasingly more educated in correct systems for different applications as well as proper installation, enforcing stricter compliance and increased extent of ramifications for non-compliance.

The extent of survey findings and deficiencies demonstrate a lack of knowledge of the correct systems and procedures for firestop and fire-resistive joint systems installation, which can be alleviated by requiring that all work be performed by a approved/qualified contractor.

The cost for corrections can be greatly reduced if the contractor is properly trained and approved/qualified. Initial construction costs remain the same for installation by an approved/qualified contractor, as the cost of approval/qualification is not substantial enough to pass along to the customer as a cost of the work. These costs can range from $6,000 to $10,000 for the initial audit and approximately $3,000 annually for ongoing audits by Underwriters Laboratories and Factory Mutual, less than many contractors would spend on bidding a sizable project, attending a trade show, entertaining or advertising. Since any firm is eligible to obtain FM Approved Firestop Contractor and/or UL Qualified Firestop Contractor, experience shows that the main factor, the cost, can be recovered through the benefits of improved processes and reduced errors on projects.

Given that the contractor's cost for obtaining FM Approved Firestop Contractor and/or UL Qualified Firestop Contractor is minimal, the real factor is the on-going cost of repairs for incorrect or improperly installed systems, which remains a financial burden to most healthcare facilities. Annual outlay of capital dollars for continual corrections and repairs is commonplace for most healthcare facilities and is rarely even considered in the initial construction process.

Requiring installation of UL Firestop systems by approved/qualified firestop contractors is consistent with other code requirements mandating installation by certified contractors of other life safety systems such as medical gas systems certification of contractors and/or installers. Approval or qualification programs administered by approved agencies such as FM Approvals and Underwriters Laboratories currently exist for contractors who install materials that become firestop systems. Any contractor (trade or specialty firestop contractor) installing fire-resistant joint systems can be approved or qualified to the programs administered by these agencies. The programs are similar to ISO 9000 that is used for the manufacturing environment, but adjusted for the construction environment. Successful completion verifies that the company has policies and procedures in place that are sufficient to control operations resulting in installations conforming to the listed firestop system.

Availability of approved/qualified contractors that can easily attain the certification exists in virtually every state. Whereas the proposal is for the 2015 Edition of the IBC, it is reasonable to anticipate that many more contractors will participate in the programs prior to adoption of the Code.

Cost Impact: None

FS78-12

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS114 – 12
717.5.5 (IMC 607.5.4)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Healthcare

Revise as follows:

717.5.5 (IMC 607.5.4) Smoke barriers. A *listed smoke damper* designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a *smoke barrier*. *Smoke dampers* and *smoke damper* actuation methods shall comply with Section 717.3.3.2.

Exceptions:

1. *Smoke dampers* are not required where the openings in ducts are limited to a single smoke compartment and the ducts are constructed of steel.
2. Smoke dampers are not required in ambulatory care facilities and Group I-2 hospital occupancies where the HVAC system is fully ducted in accordance with Section 603 of the *International Mechanical Code* and where buildings are equipped throughout with an automatic sprinkler system in accordance with Sections 903.3.1.1 and equipped with quick response sprinklers in accordance with Section 903.3.2.

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx

Duct smoke dampers at smoke barrier walls in facilities fully protected with electronically supervised, tested and maintained quick response automatic sprinkler systems should be omitted from the I-codes, have not been required by other model codes and have shown a history of success without the additional dampers. In preparation for this proposal the AHC asked Rolf Jensen & Associates (RJA) to review and provide comments on the "Smoke Damper Evaluation for Air Movement & Control Association International, Inc." analysis and dated May 14, 2010. A copy of their summary can be found at www.iccsafe.org.

The supporting information, summarized by RJA for the AHC, describes information gathered in the years since quick response sprinklers (QRS) have been deployed. Untenable conditions are typically measured in amount of heat, obscuration of exit signs, and carbon monoxide levels. The studies summarized these conditions taking approximately 2 hours to 2-1/2 hours to reach untenable levels. Considering non-smoking policies in hospitals, use of Class A materials, and overall reduction of items to fuel a fire, it is highly unlikely to reach the constant burning levels noted in the study. However, even if judged in those timeframes noted in the report, the actual responder timeframe should enter into the equation. The following summarizes emergency responder timeframes:

Alarm is sounded, either by manual pull by the staff or by the automatic smoke detection system (most likely an addressable system)

- Staff employs defend-in-place method, which includes shutting doors to the origin of the fire and relocating patients out of the immediate area (i.e. to the other side of the compartment smoke barrier)
- Within 10 minutes of alarm, the fire department arrives
- In the context of the fire response, doors are opened by the fire department to find the source of the fire. These are the doors that automatically closed upon initiation of the alarm. Any mechanical system is now out of the equation, because of the active use of the doorways in the fire response, or if needed, the patient movement away from the room of origin.

In conclusion, the meaningful time of the fire protection of the building occurs in the first 30 minutes of the fire incident, when decisions are made by fire professionals and the safety staff of the hospital in terms of status of the patients. Quick response sprinklers are more often noted as the most important feature of the overall building fire protection system, and are demonstrated to be effective in containing spread of the fire than dampering of the duct system.

Please note that this proposal deals only with smoke zone barrier walls. It is not proposed to change the requirement for these dampers at shafts or at the air handler units.

The RJA comments are as follows:

Evaluations of recent automatic sprinkler performance data and smoke movement analysis report for smoke dampers revealed the following:

1. In 3,750 fires reported over the years of 2003 – 2006 in hospitals, mental health and substance abuse facilities; one civilian death was recorded. That individual was within the room of fire origin within a mental health facility and started the fire.
2. The overwhelming majority (i.e. 97+%) of fires within these facilities did not extend beyond the room of origin, despite having an automatic suppression system present in only 57% of reported fires.
3. Automatic sprinkler protection in a hospital has higher reliability and better performance than other occupancies. In over 1,600 fires in hospitals spanning 2003 - 2006, when sprinklers were present and the fires were large enough to activate an automatic suppression system, those systems showed a 97% operational reliability and were effective 100% of the time.
4. The requirements for electronically supervised hydraulically designed automatic sprinkler system increases the system reliability
5. Properly documented testing and maintenance improves the reliability of these systems. CMS holds healthcare facility operators accountable for the testing and maintenance requirements of NFPA 25. Verification of this documentation and maintenance records are checked every 1 to 3 years.
6. Tenable conditions are present in the smoke movement analysis for sprinklered buildings with or without smoke dampers.
7. Tenable conditions in non sprinklered configurations can be maintained for test fire duration of 30 minutes beyond room of origin.

Due the required automatic system design requirements, the limited smoke movement in a fully sprinklered building, required testing and maintenance of these suppression systems, the omission of smoke dampers is justified. There are still multiple safeguards to protect the building occupants from a multiple loss of life fire.

The use of smoke dampers between smoke zones in hospitals protected with Quick Response automatic Sprinklers (QRS) is being evaluated based on the reports of fire outcomes in hospitals; automatic sprinkler system reliability, performance, and effectiveness; and an assessment of previous smoke movement work in non sprinklered configurations.

NFPA issued an updated report on automatic sprinkler performance in two different reports [(1)(2)]. The reported data has been reviewed and evaluated for hospital facilities when possible. The failure modes will be reviewed and addressed based on current Building Code and Fire Code requirements.

Jennifer Flynn's report [(2)] shows there were 3,750 fires reported to have occurred over the years of 2003 – 2006 in hospitals, mental health, substance abuse and medical office type facilities. In all those fires, one fatality was reported, and that fatality occurred within the room of fire origin. That one fatality occurred as a result of a mental health patient using flammable liquids and igniting the mattress and other materials within his room.

Of reported 2003-2007 structure fires in health care properties, an estimated 57% showed sprinklers present, with higher percentages for hospitals (71%) and nursing homes (65%) and a much lower percentage for clinics and doctor's offices (28%). Sprinklers were also reported as present in half or more of all reported fires in laboratories (60%), manufacturing facilities (52%), theaters (50%), and prisons and jails (50%). In every other property use, more than half of all reported fires had no sprinklers.

Hospitals have the highest percentage of automatic sprinklers present in all the occupancies analyzed in this report. Despite suppression systems being present in only
57% of health care properties where fires were reported, those fires only extended beyond the room of origin in less than 3 percent of all reported fires. This can be directly attributed to the **R.A.C.E.** training medical staff are mandated to receive annually. The **C** in RACE relates to *confining* the fire. More simply, medical staff are trained to close the doors in rooms where fires ignite, after they **R**escue patients near the fire origin and **A**lert others of the presence of the fire.

For most property use groups and most types of automatic extinguishing equipment, the majority of reported fires were too small to activate operational equipment.
When automatic extinguishing equipment was present, the percentages of fires too
small to activate operating equipment, based on overall reported structure fires, were as follows:

- 65% for all sprinklers,
- 65% for wet pipe sprinklers,
- 70% for dry pipe sprinklers,
- 61% for dry (or possibly wet) chemical systems,
- 43% for carbon dioxide systems,
- 66% for foam systems, and
- 59% for halogen systems.

Sprinklers in the area of fire failed to operate in only 7% of reported structure fires large enough to activate sprinklers. Based on Table A [(1)] , non confined fires larger than the sprinkler design area happened less than 2.0 % of the total non-confined and confined structure fires for healthcare buildings. These fires may affect a large part of a smoke compartment but they rarely happen.

Table 3A [(1)] indicates the percentage of effective operation of sprinklers in 620 fires large enough for sprinkler activation at 87% in all healthcare related facilities. The Flynn report breaks this down by type of healthcare facility. Where sprinklers were present and the fire was large enough to operate the sprinklers in hospitals alone, sprinklers were effective 100 percent of the time.

The assessment of automatic sprinkler failures are summarized in Table 4A [(1)]. However, healthcare or hospitals are not separated as an occupancy type.
The reason sprinklers fail to operate in all occupancies are:

1. System turned off 53%
2. Inappropriate suppression system 20%
3. Lack of Maintenance 15%
4. Manual intervention 9%
5. System component damages 2%

In new and existing hospitals, the automatic sprinkler systems require electronic supervision. This supervision will typically address the major (53%) reason for system failure. This analysis is limited to hospitals. Automatic water based suppression is the appropriate means to control fires in this healthcare occupancy. This addresses 20% of the documented failures. Automatic water based suppression systems are required for all new hospitals and all renovations over 4000 square feet. 73%of the failures are addressed by electronically supervised automatic sprinkler systems.

Lack of maintenance is addressed by the CMS enforcement which ensures facilities follow NFPA 25. Existing healthcare facilities are required to document the NFPA 25 inspection, testing and maintenance on all water based suppression systems. Through contracts with state public health and fire marshal's offices that direct periodic surveys, CMS ensures that the needed inspection, testing and maintenance is provided in health care facilities. This work will also identify damaged system components. The required testing and maintenance and damage will address 17% of the documented failures.

Manual intervention is a fire service function. Standard operating procedures recommend determining the fire no longer poses a threat before shutting the system down.

The Hall report [(1)] also notes reasons for ineffectiveness of systems. This category addresses the effectiveness of a system not the failure. These systems still operated but not at the design intent. These have 2 major categories. Extinguishing agent did not reach the fire and not enough extinguishing agent available.

Shielded fires are the first category. These can be addressed by proper design. Small shielded fires under tables or beds are within the design parameters of a NFPA 13 compliant sprinkler system. Missing areas under duct work or within storage racks are the typical issues in this category. These types of items, if missed in the initial design and installation, should be identified in the ongoing testing and maintenance required by NFPA 25.

Insufficient extinguishing agent addresses inadequate water supply and partially closed valves. Proper maintenance and testing will identify a deteriorating water supply. The electronic supervision required for the hospital sprinkler system will send a trouble alarm to the fire alarm panel for partially closed control valves.

The hydraulically designed, electronically supervised, and regularly tested and maintained automatic sprinkler system is substantially more reliable than the current performance data indicate. Fire loss data also shows there has not been a documented multiple loss of live fire due to fire in a fully sprinklered building.

This sprinkler system analysis was done to evaluate the current data and how it relates to hospitals and demonstrates that the probability of a catastrophic failure of the required sprinkler system is remote. The biggest influence on the automatic sprinkler performance is the fire services for a properly designed, installed and maintained sprinkler system.

SMOKE DAMPER EVALUATION – ADDITIONAL CONSIDERATIONS

This portion of the reason statement evaluates an analysis prepared by Koffel Associates, Inc. (KA) titled "Smoke Damper Evaluation for Air Movement & Control Association International, Inc." and dated May 14, 2010. The purpose of our evaluation is to closely examine the details, assumptions, and conclusions related to the KA analysis to quantify the severity of hazardous conditions expected given the smoke spread predicted in the analysis for the scenarios with and without smoke dampers.

The KA analysis utilized a CONTAM computer model to predict smoke movement throughout a representative building under various conditions. The primary variables considered in this comparative analysis were whether the fire was sprinklered or unsprinklered and whether smoke dampers were included or omitted from the model. Data from a study titled "Fire Experiments of Zoned Smoke Control at the Plaza Hotel in Washington DC" by John H. Klote at the National Institute of Standards and Technology (NIST), 1990, was used as a basis for modeling smoke in the CONTAM model. Specifically, the KA analysis assumed a smoke concentration of 5.66×10^{-5} lb/ft^3 in the compartment of origin for the unsprinklered fire scenario and a concentration of 1.89×10^{-6} lb/ft^3 for the sprinklered fire scenario which is reportedly based on the fire test data contained in the Klote study.

The Klote study involved real fire tests conducted in the Plaza Hotel, a seven-story masonry structure. The Plaza Hotel tests were intended to evaluate the effectiveness of zoned mechanical smoke control systems. While not specified in the KA analysis, it appears that data from Plaza Hotel Test 1 and/or Test 5 was used for the unsprinklered fire scenario and data from Test 10 was used for the sprinklered fire scenario. Each of these three fire tests involved burning a 300 lb wood crib in a second floor corridor of the Plaza hotel with no mechanical smoke control systems active and all windows closed. Table 1 and Table 2 below summarize the select relevant data presented in the Klote study and KA analysis. This data shows movement away from the area of fire origin with and without smoke dampers installed in the model.

Table 1: Klote Study Results

	Tests 1 and 5	Test 10
Fuel Load	300 lb Wood Crib	300 lb Wood Crib
Test Duration	30 min	30 min
Sprinkler Interaction	No Sprinklers	Quick Response Sprinkler above Wood Crib
Peak Optical Density on Fire Floor (Fig. 24, 25)	3 m^{-1} @ 4 $mins^{1}$	0.1 m^{-1} @ 3 mins
Peak CO Concentration on Fire Floor (Fig. 21)	~6,000 ppm	~200 ppm

The maximum optical density from Tests 1 and 5 was not reported in the Klote study. This optical density value is estimated based on the CO concentrations, which show a factor of 30 differential between the sprinklered and unsprinklered fire scenarios. This factor of 30 was applied to the maximum optical density value that was reported in the sprinklered fire test (Test 10). This assumption matches the KA analysis which assumed a smoke concentration for the unsprinklered fire scenario that was approximately 30 times the sprinklered scenario.

Table 2: KA Analysis Results
Smoke Concentration on Non-Fire Floor
(presented as % of smoke concentration on Fire Floor)

	Smoke Dampers	Without Smoke Dampers
5 Story Building @ 30 mins	1.37%	25.05%
5 Story Building @ 1 hour	2.51%	40.33%
5 Story Building @ 12 hours	7.78%	64.28%
50 Story Building @ 30 mins	0.11%	2.88%
50 Story Building @ 1 hour	0.21%	5.21%
50 Story Building @ 12 hours	0.69%	15.15%

The most severe conditions on the non-fire floor predicted by the KA analysis consider a 5 story building, no smoke dampers, and a constant smoke concentration on the fire floor over a 12-hour period. This scenario predicted that after 12 hours, the conditions on the non-fire floor, in terms of smoke concentrations, would be 64.28% of the conditions on the fire floor. After 30 minutes of constant conditions on the fire floor, the non-fire floor smoke concentration is 25.05% of that on the fire floor.

It should be noted that the assumption of constant peak smoke conditions for an extended period of time (as much as 12 hours) on the fire floor is extremely conservative. The Klote study data is based on a 30 minute test duration where the peak smoke concentrations (obscuration and CO concentrations) occur at one particular instance during the 30 minute test. Further, a fire burning at a constant rate over a 12 hour period of time would necessitate a fuel load to support such a fire. The most densely packed storage occupancies have fuel loads approaching only 3 or 4 hours.

The KA assumption is particularly conservative when considering the sprinkler controlled fire where Klote's study indicates that the fire in Test 10 was extinguished about 7 minutes after fire ignition. Klote's study also indicates that for the unsprinklered fires (Tests 1 and 5) the heat release rate of the fire decreased due to low oxygen levels after approximately 15 minutes as can be seen by the reduction in temperature shown in Figure 12 of the Klote study. So, maintaining a constant fire burning rate over a 30- minute duration is unlikely and is a very conservative assumption, especially in a building like hospitals that is occupied 24/7 by alert staff.

The following tables are intended to assess the degree of tenable conditions that may be present on the non-fire floor (for cases with and without smoke dampers) considering the referenced data from the Klote's study and the smoke concentration modeling performed in the KA analysis. The data in Table 3 is based on the CONTAM model results for the 5 story building only, which was the most challenging building configuration in terms of smoke concentrations on the non-fire floor.

Table 3: Tenability Analysis- Sprinklered Fire Scenario

Klote Test 10 (Sprinklered Fire)		
Peak Optical Density (D) on Fire Floor (Fig. 24, 25)	0.1 m^{-1} @ 3 mins	
Peak CO Concentration on Fire Floor (Fig. 21)	~200 ppm	
Calculated Visibility Based on Optical Density[1]	34.8 m (lighted sign)	
	With Smoke Dampers	**Without Smoke Dampers**
Predicted CO Concentration on Non-Fire Floor at 30 mins	200 ppm * 1.37% = **3 ppm**	200 ppm * 25.05% =**50 ppm**
Predicted Visibility on Non-Fire Floor at 30 mins	34.8 m / 1.37% = **2538 m**	34.8 m / 25.05% = **138 m**
Predicted CO Concentration on Non-Fire Floor at 1 hour	200 ppm * 2.51% = **5 ppm**	200 ppm * 40.33% =**81 ppm**
Predicted Visibility on Non-Fire Floor at 1 hour	34.8 m / 2.51% =**1385 m**	34.8 m / 40.33% = **86 m**
Predicted CO Concentration on Non-Fire Floor at 12 hours	200 ppm * 7.78% =**16 ppm**	200 ppm * 64.28% =**129 ppm**
Predicted Visibility on Non-Fire Floor at 12 hours	34.8 m / 7.78% =**447 m**	34.8 m / 64.28% =**54 m**

[1] The optical densities (D) reported in the Klote Study were converted to light extinction coefficients (K) by K=2.3D and visibilities (V) were calculated to light-emitting (exit) sign by V-8/K.

Table 4: Tenability Analysis- Unsprinklered Fire Scenario

Klote Tests 1 and 5 Data (Unsprinklered Fire)		
Peak Optical Density (D) on Fire Floor (Fig. 24, 25)	3 m^{-1} @ 4 min	
Peak CO Concentration on Fire Floor (Fig. 21)	~6,000 ppm	
Calculated Visibility Based on Optical Density [1]	1.2 m (lighted sign)	
	With Smoke Dampers	**Without Smoke Dampers**
Predicted CO Concentration on Non-Fire Floor at 30 mins	6,000 ppm * 1.37% =**83 ppm**	6,000 ppm * 25.05% =**1503 ppm**
Predicted Visibility on Non-Fire Floor at 30 mins	1.2 m / 1.37% = **84.7 m**	1.2 m / 25.05% = **4.6 m**
Predicted CO Concentration on Non-Fire Floor at 1 hour	6,000 ppm * 2.51% =**151 ppm**	6,000 ppm * 40.33% =**2420 ppm**
Predicted Visibility on Non-Fire Floor at 1 hour	1.2 m / 2.51% =**46.2 m**	1.2 m / 40.33% = **2.9 m**
Predicted CO Concentration on Non-Fire Floor at 12 hour	6,000 ppm * 7.78% =**467 ppm**	6,000 ppm * 64.28% =**3857 ppm**
Predicted Visibility on Non-Fire Floor at 12 hour	1.2 m / 7.78% =**14.9 m**	1.2 m / 64.28% =**1.8 m**

[1]The optical densities (D) reported in the Klote Study were converted to light extinction coefficients (K) by K=2.3D and visibilities (V) were calculated to light-emitting (exit) sign by V=8/K.

The KA analysis discusses tenability on the non-fire floor in terms of visibility through smoke. A tenability performance criterion of approximately 10 meters (30 feet) is cited by the KA analysis as a commonly used value. While this visibility criterion is within ranges of visibility criteria for general building applications presented by The SFPE Handbook, 4th edition (Section 2, Chapter 4) Table 2-4.3, a lower criterion of 4 meters is suggested for healthcare occupancies where patients and staff are familiar with their surroundings and egress paths are typically defined by small rooms and corridors as opposed to large open

spaces where greater visibility is necessary. Table 2-4.2 of the SFPE Handbook suggest a visibility threshold of 4 meters to allow safe escape when occupants are familiar with their surroundings.

Although not referenced in the KA analysis, tenability is also often measured in terms of carbon monoxide (CO) concentrations. CO is a measure of the toxicity of smoke that occupants are exposed to during evacuation. Carbon monoxide (CO) causes the formation of carboxyhemoglobin in the bloodstream when it is being breathed in the air during exposure. This relationship between exposure time and the concentration of carbon monoxide is dynamic, varying based upon the varying concentrations of CO within the surroundings and the physical condition of the individual. A more detailed discussion of the formation of carboxyhemoglobin can be found in the SFPE Handbook, 4th edition (Section 2, Chapter 6). Figure 2-6.14 of the SFPE Handbook indicates that occupant exposure with an at rest respiratory rate to a carbon monoxide concentration of 2,000 parts per million (ppm) can be experienced for 30 minutes before incapacitation occurs. Based on this relationship between exposure time and concentration, a conservative tenability criterion for carbon monoxide concentrations of 2000 ppm is suggested.

Based on the tenability criteria of 4 meters for visibility and 2000 ppm for CO concentrations, the data in the Klote study for the sprinklered fire indicates that conditions were tenable on the fire floor during the 30 minute fire test as the minimum visibility was measured to be 34.8 meters to a lighted exit sign and a maximum CO concentration of approximately 200 ppm. If the conditions on the fire floor are tenable, then any lower concentrations of smoke on non-fire floors, as predicted by the KA analysis, will also be tenable. This suggests that for sprinkler controlled fires, tenable conditions will be maintained on the non-fire floor, regardless of whether smoke dampers are installed, when considering the assumptions contained in the KA analysis. This is further supported by a study performed by Notarianni, "Measurement of Room Conditions and Response of Sprinklers and Smoke Detectors During a Simulated Two- Bed Hospital Patient Room Fire", NISTIR 5240, 1993 which assessed performance of sprinklers and smoke detectors in typical hospital room configurations. This study concluded that in all tests, with one exception, the sprinklers actuated in the room of fire origin before the patient's life would be threatened. The one exception was the shielded fire test where the sprinklers activated after untenable conditions were reached in the patient room. This study supports the assertion that in most cases sprinklers will activate and control further growth of the fire before untenable conditions are reached in the room of origin. Therefore, the sprinklers help to control the spread of untenable conditions throughout the building.

The results of for the unsprinklered fire scenario in Table 4 above show a minimum visibility on the non-fire floor of 4.6 meters to a lighted exit sign and a maximum CO concentration of 1503 ppm after 30 minutes of constant peak conditions on the fire floor. Based on the tenability criteria cited above of at least 4 meters of visibility and a maximum CO concentration of 2000 ppm, the conditions after 30 minutes for the unsprinklered fire scenario can also be considered tenable. It should be noted that the lowest visibility conditions in the Klote study occurred no earlier than 4 minutes after fire ignition and the maximum CO concentrations occurred no earlier than 15 minutes after fire ignition. The KA analysis for the 30 minute exposure assumes these most severe conditions on the fire floor from fire ignition (time zero) which indicates that tenable conditions should be maintained on the non-fire floor for more than 30 minutes after fire ignition when considering the delay in the Klote tests from ignition to when the most severe conditions occur in on the fire floor.

For the 1991 edition of NFPA 101, the Subcommittee on Health Care Occupancies performed studies that evaluated the benefits of healthcare occupancies when provided with a fully automatic sprinkler system and quick response sprinkler heads. All new Group I-2 buildings are required to be provided with a fully automatic sprinkler system and QRS. The studies discussed and mentioned above provide further scientific documentation that sprinklers are a more than effective means of mitigating the transfer of smoke beyond smoke compartment walls, as was discussed over twenty years ago.

Additionally, the requirements for interior finishes, decorative materials, mattresses, upholstered furniture, decorative vegetation and other decorative furnishings have become more restrictive in the past twenty years as well. Test standards have been developed to further quantify statistical information regarding the flame spread and smoke development of each of these above items. With these added restrictions within Group I-2 occupancies, the flame spread and smoke development ratings of these have assisted in the reduction of a greater potential event.

This review and analysis of previous fire tests, studies, and performance data provides a basis for justification to omit smoke dampers in new I-2 healthcare facilities. The performance of a building without automatic sprinkler protection has many variables to consider. The analysis above does look at typical non sprinklered scenarios and shows acceptable performance for at least the first 30 minutes. Emergency responders will be on site to assist the staff in a fire response. The recent fire records in healthcare facilities both sprinklered and non sprinklered show an ability to protect the person not intimate with a fire.

Bibliography

(1) *U.S. Experience with Sprinklers and Other Automatic Fire Extinguishing Equipment*, John R. Hall, Jr. P.E. PhD, National Fire Protection Association, 2010

(2) *Structure Fires in Medical, Mental Health, and Substance Abuse Facilities*; Jennifer D. Flynn; National Fire Protection Association; February 2009

Cost Impact: The code change proposal will reduce the cost of construction and will eliminate on-going maintenance costs.

FS114-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G32 – 12

PART I – INTERNATIONAL BUILDING CODE

202, 308.1, 308.4, 308.7 (NEW), 404.5, 425 (NEW),Table 503, 504.2, Table 509, 710.8, 712.1.8, 713.14.1, 717.5.5, Table 1016.2, Table 1018.1, Table 1018.2, 1018.4, 1107.5.3.1, 3304.8 (NEW), 3311.3 (NEW); (IFC [B] 202, Table 1016.2, Table 1018.1, Table 1018.2, 1018.4)

PART II – INTERNATIONAL FIRE CODE

IFC 903.2.6, 903.3.2, 907.2.6, 907.2.6.2, 907.2.6.4 (NEW), 909.4.6; (IBC [F] 425.5, 425.6, 425.7, 903.2.6, 903.3.2, 907.2.6, 907.2.6.2, 907.2.6.4 (NEW), 909.4.6)

Proponent: Jeff Bresette, FP&C Consultants, Inc.

THIS IS A 2 PART CODE CHANGES. BOTH PARTS WILL BE HEARD BY HEARD BY THE IBC GENERAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE IBC GENERAL COMMITTEE.

Revise as follows:

SECTION 202
DEFINITIONS

CARE SUITE. In Group I-5 occupancies, a group of treatment rooms, care recipient sleeping rooms and the support rooms or spaces and circulation space within the suite where staff are in attendance for supervision of all care recipients within the suite, and the suite is in conformance with the requirements of Section 425.4.2.

CARE SUITE. Within Group I-2 occupancies, a group of treatment rooms, care recipient sleeping rooms and their associated support rooms or spaces and circulation space ~~within Group I-2 occupancies~~ where staff are in attendance for supervision of all care recipients within the suite, and the suite is in compliance with the requirements of Section 407.4.3.

DEFEND IN PLACE. A method of emergency response that engages building components and trained staff to provide occupant safety during an emergency. Emergency response involves remaining in place, relocating within the building, or both, without evacuating the building.

Revise as follows:

308.1 Institutional Group I. Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which care or supervision is provided to persons who are or are not capable of self-preservation without physical assistance or in which persons are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3, ~~or~~ I-4 or I-5.

308.4 Institutional Group I-2. This occupancy shall include buildings and structures used for ~~*medical care*~~ *custodial care* on a 24-hour basis for more than five persons who are *incapable of self-preservation*. This group shall include, but not be limited to, the following:

Foster care facilities
Detoxification facilities
~~*Hospitals*~~
Nursing homes
~~*Psychiatric hospitals*~~

308.7 Group I-5, Hospitals. This occupancy shall include buildings and structures used for *medical care*, on a 24-hour basis for more than five persons who are *incapable of self-preservation*. This group shall include, but not be limited to, the following:

Hospitals and psychiatric hospitals.

Revise as follows:

404.5 Smoke control. A smoke control system shall be installed in accordance with Section 909.

Exception: In other than Groups I-2 and I-5, smoke control is not required for *atriums* that connect only two *stories.*

SECTION 425
GROUP I-5 HOSPITALS AND PSYCHIATRIC HOSPITALS

425.1 General. Occupancies in Group I-5 shall comply with the provisions of Sections 425.1 through 425.9 and other applicable provisions of this code.

425.2 Corridors. *Corridors* in occupancies in Group I-5 shall be continuous to the *exits* and separated from other areas in accordance with Section 424.3 except spaces conforming to Sections 425.2.1 through 425.2.3.

425.2.1 Areas open to corridor unlimited area shall be permitted to be open to a *corridor*, provided there is no treatment, patient sleeping or hazardous areas open to the *corridor* and are constructed as required for *corridors* and where all of the following criteria are met:

1. The open space is protected by an automatic fire detection system installed in accordance with Section 907.
2. The *corridors* onto which the spaces open, in the same smoke compartment, are protected by an automatic fire detection system installed in accordance with Section 907, or the smoke compartment in which the spaces are located is equipped throughout with quick-response sprinklers in accordance with Section 903.3.2.
3. The space is arranged so as not to obstruct the *exit access* to the required *exits*.

425.2.2 Care providers' stations. Spaces for care providers', supervisory staff, doctors' and nurses' charting, communications and related clerical areas shall be permitted to be open to the *corridor*, when such spaces are constructed as required for *corridors*.

425.2.3 Gift shops. Gift shops and associated storage less than 500 square feet (46.5 m^2) in area shall be permitted to be open to the *corridor* provided the gift shop and storage areas are fully sprinklered and storage areas are protected in accordance with Section 509.4.

425.3 Corridor walls. *Corridor* walls shall be constructed as smoke partitions in accordance with Section 711.

425.3.1 Corridor doors. *Corridor* doors, other than those in a wall required to be rated by Section 509.4 or for the enclosure of a vertical opening or an *exit*, shall not have a required *fire protection rating* and shall not be required to be equipped with self-closing or automatic-closing devices, but shall provide an effective barrier to limit the transfer of smoke and shall be equipped with positive latching. Roller latches are not permitted. Other doors shall conform to Section 716.5.

425.3.2 Locking devices. Locking devices that restrict access to the patient room from the *corridor*, and that are operable only by staff from the *corridor* side, shall not restrict the *means of egress* from the patient room except for patient rooms in mental health facilities.

425.4 Means of egress. Group I-5 occupancies shall be provided with a means of egress complying with Chapter 10 and Sections 407.4.1 through 407.4.3.6.2 and this section. The fire safety and evacuation plans provided in accordance with Section 1001.4 shall identify the building components necessary to support a *defend in place* emergency response in accordance with Sections 404 and 408 and the International Fire Code.

425.4.1 Travel distance. The travel distance between any point in a Group I-5 occupancy sleeping room, not located in a *care suite*, and an *exit access* door in that room shall be not greater than 50 feet (15 240 mm).

425.4.2 Group I-5 care suites. *Care suites* in Group I-5 shall comply with Section 425.4.2.1 through 425.4.2.2 and either Section 425.4.2.3 or 425.4.2.4.

425.4.2.1 Exit access through care suites. *Exit access* from all other portions of a building not classified as a *care suite* shall not pass through a *care suite*. In a *care suite* required to have more than one *exit*, one *exit access* is permitted to pass through an adjacent *care suite* provided all of the other requirements of Sections 425.4 and 1014.2 are satisfied.

425.4.2.2 Separation. *Care suites* shall be separated from other portions of the building by a smoke partition complying with Section 710.

425.4.2.3 Access to Corridor. Movement from habitable rooms shall not require passage through no more than 3 doors and 100 feet (30 480 mm) travel distance within the suite.

> **Exception:** The travel distance shall be permitted to be increased to 125 feet (38 100 mm) where an automatic smoke detection system is provided throughout the *care suite* and installed in accordance with NFPA 72.

425.4.2.4 Care suites containing sleeping room areas. Sleeping rooms shall be permitted to be grouped into *care suites* if one of the following conditions is met:

1. The *care suite* is not used as an *exit access* for more than eight care recipient beds.
2. The arrangement of the *care suite* allows for direct and constant visual supervision into the sleeping rooms by care providers.
3. An automatic smoke detection system is provided in the sleeping rooms and installed in accordance with NFPA 72.

425.4.2.4.1 Area. *Care suites* containing sleeping rooms shall be not greater than 7,500 square feet (696 m^2) in area.

> **Exception:** *Care suites* containing sleeping rooms shall be permitted to be not greater than 10,000 sq feet (929 m^2) in area where an automatic smoke detection system is provided throughout the *care suite* and installed in accordance with NFPA 72.

425.4.2.4.2 Exit access. Any sleeping room, or any *care suite* that contains sleeping rooms, of more than 1,000 square feet (93 m^2) shall have no fewer than two *exit access* doors from the care suite located in accordance with Section 1015.2.

425.4.2.5 Care suites not containing sleeping rooms. Areas not containing sleeping rooms, but only treatment areas and the associated rooms, spaces or circulation space shall be permitted to be grouped into *care suites* and shall conform to the limitations in Section 425.4.2.5.1 and 425.4.2.5.2.

425.4.2.5.1 Area. *Care suites* of rooms, other than sleeping rooms, shall have an area not greater than 10,000 square feet (929 m^2).

425.4.2.5.2 Exit access. *Care suites*, other than sleeping rooms, with an area of more than 2,500 square feet (232 m^2) shall have no fewer than two *exit access* doors from the *care suite* located in accordance with Section 1015.2.

425.4 Smoke barriers. *Smoke barriers* shall be provided to subdivide every *story* used by persons receiving care, treatment or sleeping and to divide other *stories* with an *occupant load* of 50 or more persons, into no fewer than two *smoke compartments*. Such *stories* shall be divided into *smoke compartments* with an area of not more than 22,500 square feet (2,092 m^2) in Group I-2 occupancies and not more than 40,000 square feet in Group I-5 hospitals and the travel distance from any point in a *smoke compartment* to a *smoke barrier* door shall be not greater than 200 feet (60,960 mm). The *smoke barrier* shall be in accordance with Section 709.

> **Exception:** Atriums provided with smoke control complying with Section 404 are not limited in area for a smoke compartment.

425.4.1 Refuge area. Refuge areas shall be provided within each *smoke* compartment. The size of the refuge area shall accommodate the occupants and care recipients from the adjoining *smoke compartments*. Where a *smoke compartment* is adjoined by two or more *smoke compartments* the minimum area of the refuge area shall accommodate the largest *occupant load* of the adjoining compartments. The size of the refuge area shall provide the following:

1. Not less than 30 net square feet (2.8 m^2) for each care recipient confined to bed or gurney.
2. Not less than 6 square feet (0.6 m^2) for each ambulatory care recipient not confined to bed or gurney and for other occupants.

425.4.2 Independent egress. A *means of egress* shall be provided from each smoke compartment created by *smoke barriers* without having to return through the smoke compartment from which *means of egress* originated.

425.4.3 Horizontal assemblies. *Horizontal assemblies* supporting *smoke barriers* required by this section shall be designed to resist the movement of smoke and shall comply with Section 711.9.

(For Sections 425.5 through 425.7 see Part II)

425.8 Hyperbaric facilities. Hyperbaric facilities in Group I-5 occupancies shall meet the requirements contained in Chapter 20 of NFPA 99.

425.9 Additions. Additions shall be separated from any existing structure, which is not conforming to the provisions for new construction, by fire walls per Table 706.4 or fire barriers per Table 707.3.10 with not less than 2-hour fire resistance construction.

425.10 Elevator Lobbies. Elevator lobbies required by Sections 711.9 and 713.14.1 shall comply with all of the following:

1. Be a minimum of 120 square feet (11.1 m^2) in area.
2. Constructed as required for *smoke partitions* in accordance with Section 710.

Revise as follows:

TABLE 503
ALLOWABLE BUILDING HEIGHTS AND AREAS[a, b]
Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane.
Building area limitations shown in square feet, as determined by the definition of "Area, building," per story

		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
GROUP	HEIGHT (feet)	A	B	A	B	A	B	HT	A	B
	STORIES (S) AREA (A)									
I-5	S A	UL UL	4 UL	2 15,000	1 11,000	1 12,000	NP NP	1 12,000	1 9,500	NP NP

(Portions of table not shown remain unchanged)

504.2 Automatic sprinkler system increase. Where a building is equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum *building height* is increased by 20 feet (6096 mm) and the maximum number of *stories* is increased by one. These increases are permitted in addition to the *building area* increase in accordance with Sections 506.2 and 506.3. For Group R buildings equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum *building height* is increased by 20 feet (6096 mm) and the maximum number of *stories* is increased by one, but shall not exceed 60 feet (18 288 mm) or four *stories*, respectively.

Exception: The use of an *automatic sprinkler system* to increase *building heights* shall not be permitted for the following conditions:

1. Buildings, or portions of buildings, classified as a Group I-2 and I-5 ~~occupancy~~ occupancies of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. Buildings where an *automatic sprinkler system* is substituted for fire-resistance rated construction in accordance with Table 601, Note d.

TABLE 509
INCIDENTAL USES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input.	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen cutoff rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies
Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic sprinkler system
In Group E occupancies, Laboratories and vocational shops, not classified as Group H, ~~located in Group E or I-2 occupancy~~	1 hour or provide automatic sprinkler system
In Group I-2 and I-5 occupancies, laboratories not classified as a Group H	1 hour and provide automatic sprinkler system
In ambulatory care facilities, laboratories not classified as a Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system

ROOM OR AREA	SEPARATION AND/OR PROTECTION
In Group I-2 and I-5 occupancies, laundry rooms over 100 square feet	1 hour
Group I-3 cells and Group I-2 and I-5 patient rooms equipped with padded surfaces	1 hour
In Group I-2 and I-5**,** physical plant maintenance shops.	1 hour
In Group I-2 and I-5 or ambulatory care facilities, Waste and linen collection rooms with containers that have an aggregate volume of 10 cubic feet or greater	1 hour
In other than ambulatory care facilities and Group I-2 and I-5, Waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In Group I-2 and I-5 or ambulatory care facilities, storage rooms greater than 100 square feet	1 hour
Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons for flooded lead-acid, nickel cadmium or VRLA, or more than 1,000 pounds for lithium-ion and lithium metal polymer used for facility standby power, emergency power or uninterruptable power supplies	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I, and R occupancies

Revise as follows:

710.8 Ducts and air transfer openings. The space around a duct penetrating a smoke partition shall be filled with an *approved* material to limit the free passage of smoke. Air transfer openings in smoke partitions shall be provided with a *smoke damper* complying with Section 717.3.2.2.

Exceptions:

1. Where the installation of a *smoke damper* will interfere with the operation of a required smoke control system in accordance with Section 909, *approved* alternative protection shall be utilized.
2. Smoke dampers shall not be required in duct penetrations of smoke partitions in fully ducted heating, ventilating and air-conditioning systems and the mechanical system will shut down upon detection of smoke and in buildings provided with an *automatic sprinkler system* complying with Sections 903.3.1.1 and 903.3.2.

712.1.8 Two-story openings. In other than Groups ~~I-2 and~~ I-3, a floor opening that is not used as one of the applications listed in this section shall be permitted if it complies with all of the items below.

1. Does not connect more than two stories.
2. Does not contain a stairway or ramp required by Chapter 10.
3. Does not penetrate a horizontal assembly that separates fire areas or smoke barriers that separate smoke compartments.
4. Is not concealed within the construction of a wall or a floor/ceiling assembly. 5. Is not open to a corridor in Group I and R occupancies.
6. Is not open to a corridor on nonsprinklered floors.
7. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.

713.14.1 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 in Section 708 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section

716.5.3 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 717.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code. Elevator lobbies within Group I-5 occupancies shall comply with Section 425.10

Exceptions:

1. through 7. *(Exceptions not shown remain unchanged)*

717.5.5 Smoke barriers. A *listed smoke damper* designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a *smoke barrier*. *Smoke dampers* and *smoke damper* actuation methods shall comply with Section 717.3.3.2.

Exceptions:

1. *Smoke dampers* are not required where the openings in ducts are limited to a single *smoke compartment* and the ducts are constructed of steel.
2. Smoke dampers shall not be required in Ambulatory Care Facilities and Groups I-2 and I-5 occupancies where the HVAC is fully ducted in accordance with Section 603 of the International Mechanical Code and where buildings are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and equipped with quick response sprinklers in accordance with Section 903.3.2.

Revise as follows:

TABLE 1016.2 (IFC [B] 1016.2)
EXIT ACCESS TRAVEL DISTANCE[a]

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200	250[b]
I-1	Not Permitted	250[c]
B	200	300[c]
F-2, S-2, U	300	400[c]
H-1	Not Permitted	75[c]
H-2	Not Permitted	100[c]
H-3	Not Permitted	150[c]
H-4	Not Permitted	175[c]
H-5	Not Permitted	200[c]
I-2, I-3, I-4, I-5	Not Permitted	200[c]

For SI: 1 foot = 304.8 mm.

a. See the following sections for modifications to *exit access* travel distance requirements:
Section 402.8: For the distance limitation in *malls*.
Section 404.9: For the distance limitation through an *atrium* space.
Section 407.4: For the distance limitation in Group I-2.
Sections 408.6.1 and 408.8.1: For the distance limitations in Group I-3.
Section 411.4: For the distance limitation in special amusement buildings.
Section 425.3: For the distance limitation in Group I-5.
Section 1015.4: For the distance limitation in refrigeration machinery rooms.
Section 1015.5: For the distance limitation in refrigerated rooms and spaces.
Section 1021.2: For buildings with one *exit*.
Section 1028.7: For increased limitation in assembly seating.
Section 1028.7: For increased limitation for assembly open-air seating.
Section 3103.4: For temporary structures.
Section 3104.9: For pedestrian walkways.

b. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where *automatic sprinkler systems* are permitted in accordance with Section 903.3.1.2.

c. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

TABLE 1018.1 (IFC [B] TABLE 1018.1)
CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without sprinkler system	With sprinkler system
I-2[a], I-4, I-5	All	Not permitted	0

(Portions of Table not shown remain unchanged)

TABLE 1018.2 (IFC [B] TABLE 1018.2)
MINIMUM CORRIDOR WIDTH

Occupancy	Width (minimum)
Any facilities not listed below	44 inches
Access to and utilization of mechanical, plumbing or electrical systems or equipment	24 inches
With a required occupancy capacity less than 50	36 inches
Within a dwelling unit	36 inches
In Group E with a *corridor* having a required capacity of 100 or more	72 inches
In *corridors* and areas serving gurney traffic in occupancies where patients receive outpatient medical care, which causes the patient to be incapable of *self-preservation*	72 inches
Group I-2 and I-5 in areas where required for bed movement	96 inches

For SI: 1 inch = 25.4 mm.

1018.4 (IFC [B] 1018.4) Dead ends. Where more than one *exit* or *exit access doorway* is required, the *exit access* shall be arranged such that there are no dead ends in *corridors* more than 20 feet (6096 mm) in length.

Exceptions:

1. In occupancies in Group I-3 of Occupancy Condition 2, 3 or 4 (see Section 308.5), the dead end in a *corridor* shall not exceed 50 feet (15 240 mm).
2. In occupancies in Groups B, E, F, I-1, M, R-1, R-2, R-4, S and U, where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the length of the dead-end *corridors* shall not exceed 50 feet (15 240 mm).
3. A dead-end *corridor* shall not be limited in length where the length of the dead-end *corridor* is less than 2.5 times the least width of the dead-end *corridor*.
4. In occupancies in Group I-5 occupancies where the building is equipped throughout with an *automatic sprinkler system* in accordance with Sections 903.3.1.1 and 903.3.2 the length of the dead-end corridor shall not exceed 30 feet (9 144 mm).

Revise as follows:

1107.5.3 Group I-2 hospitals. *Accessible units* and *Type B units* shall be provided in general-purpose hospitals, psychiatric facilities and detoxification facilities of Group I-2 and Group I-5 occupancies in accordance with Sections 1107.5.3.1 and 1107.5.3.2.

1107.5.3.1 Accessible units. At least 10 percent, but not less than one, of the *dwelling units* and *sleeping units* shall be *Accessible units*.

Exception: Entry doors to Accessible dwelling or sleeping units shall not be required to provide the maneuvering clearance beyond the latch side of the door.

Revise as follows:

3304.8 Group I-5. For buildings employing a *defend in place* method in Group I-5 occupancies, an on-site fire watch shall be provided in accordance with the Section 901.7 of the *International Fire Code*.

3311.3 Group I-5. Temporary construction within corridors serving bed or stretcher movement in Group I-5 occupancies shall not reduce the corridor width to less than 60 inches.

PART II – INTERNATIONAL FIRE CODE

Add new definition as follows:

IBC [F] 425.5 Automatic sprinkler system. Quick-response or residential sprinklers shall be provided in accordance with Section 903.3.2

IBC [F] 425.6 Fire alarm system. A fire alarm system shall be provided in accordance with Section 907.2.6.

IBC [F] 425.7 Automatic fire detection. Group I-5 occupancies shall be equipped with smoke detection as required in Section 425.2.

Revise as follows:

903.2.6 (IBC [F] 903.2.6) Group I. An *automatic sprinkler system* shall be provided throughout buildings with a Group I *fire area*.

Exceptions:

1. An automatic sprinkler system installed in accordance with Section 903.3.1.2 shall be permitted in Group I-1 facilities.
2. An *automatic sprinkler system* installed in accordance with Section 903.3.1.3 shall be allowed in Group I-1 facilities when in compliance with all of the following:
   2.1. A hydraulic design information sign is located on the system riser;
   2.2. Exception 1 of Section 903.4 is not applied; and
   2.3. Systems shall be maintained in accordance with the requirements of Section 903.3.1.2.
3. An *automatic sprinkler system* is not required where day care facilities are at the *level of exit discharge* and where every room where care is provided has at least one exterior exit door.
4. In buildings where Group I-4 day care is provided on levels other than the *level of exit discharge*, an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be installed on the entire floor where care is provided and all floors between the level of care and the level of *exit discharge*, all floors below the *level of exit discharge*, other than areas classified as an open parking garage.
5. In Group I-5 occupancies, an *automatic sprinkler system* is not required in closets less than 6 square feet in area.

903.3.2 (IBC [F] 903.3.2) Quick-response and residential sprinklers. Where *automatic sprinkler systems* are required by this code, quick-response or residential automatic sprinklers shall be installed in the following areas in accordance with Section 903.3.1 and their listings:

1. Throughout all spaces within a smoke compartment containing care recipient *sleeping units* in Group I-2 in accordance with this code.
2. Throughout all spaces within a smoke compartment containing treatment rooms in ambulatory care facilities.

3. *Dwelling units* and *sleeping units* in Group I-1 and R occupancies.
4. Light-hazard occupancies as defined in NFPA 13.
5. Group I-5 occupancies.

907.2.6 (IBC [F] 907.2.6) Group I. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group I occupancies. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be provided in accordance with Sections 907.2.6.1, 907.2.6.2, ~~and~~ 907.2.6.3.3 and 907.2.6.4.

Exceptions:

1. Manual fire alarm boxes in sleeping units of Group I-1 and I-2 occupancies shall not be required at *exits* if located at all care providers' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.4.2.1 are not exceeded.
2. Occupant notification systems are not required to be activated where private mode signaling installed in accordance with NFPA 72 is *approved* by the fire code official.

907.2.6.2 (IBC [F] 907.2.6.2) Group I-2. An automatic smoke detection system shall be installed in *corridors* in nursing homes, long-term care facilities, detoxification facilities and spaces permitted to be open to the *corridors* by Section 407.2. The system shall be activated in accordance with Section 907.5.

Exceptions:

1. Corridor smoke detection is not required in smoke compartments that contain sleeping units where such units are provided with smoke detectors that comply with UL 268. Such detectors shall provide a visual display on the corridor side of each sleeping unit and shall provide an audible and visual alarm at the care provider station attending each unit.
2. Corridor smoke detection is not required in smoke compartments that contain sleeping units where sleeping unit doors are equipped with automatic door-closing devices with integral smoke detectors on the unit sides installed in accordance with their listing, provided that the integral detectors perform the required alerting function.

907.2.6.4 (IBC [F] 907.2.6.4) Group I-5. Hospitals shall be equipped with smoke detection as required in Section 425.

909.4.6 (IBC [F] 909.4.6) Duration of operation. All portions of active or passive smoke control systems shall be capable of continued operation after detection of the fire event for a period of not less than either 20 minutes or 1.5 times the calculated egress time, whichever is ~~less~~ greater.

Reason: Hospitals historically are treated differently than other occupancies based on the need to defend in place during an emergency and that exit corridors are a work area in a hospital setting. This code change recognizes that hospitals are to be treated as a separate and distinct occupancy within the confines of the codes. The basic premise for the change is to remove health care hospitals and psychiatric hospitals from the I-2 umbrella and create a new Group I-5 category. Each of the code changes above have been brought forth by the Ad Hoc Committee for Health Care during the course of 2011, with a few exceptions. Although creating different Conditions of use within a Group I-2 occupancy is one approach, it doesn't recognize the need for separating hospitals into their own occupancy category.

Group I-3 occupancies are defined by different Conditions and are meant for restraint with different levels of securing occupants based on their level of movement capacities, from less secure to more secure. Institutional occupancies have not only different levels of supervision but also different levels of care. The current Group I-2 occupancy category has similar care levels for those that are incapable of self-preservation, but there are historical reasons why hospitals have more restrictive and prescriptive requirements than the other classifications within Group I-2, such as detoxification facilities and nursing homes. Switching hospitals to a separate occupancy is the next logical step in the progression of hospital development for the I-codes.

The scoping classification in Section 308.4 has been revised to reflect that those in nursing home, detoxification facilities, and foster care facilities receive custodial care as defined within the Section 202. Section 308.5 has been added for Group I-5 to reflect the need for medical care, also defined in Section 202.

Section 425 has been created specifically for Group I-5 occupancies. There are some code sections that overlap each of the I-2 and I-5 occupancy classifications and those are reflected above as well. The proposals brought forth by the Ad Hoc Committee for Health Care have been researched thoroughly in 2011 and all reasoning statements are well documented. Based on the work of the Ad Hoc Committee for Health Care, all of these code changes are based on the requirements of external agencies enforcing life

safety requirements from the NFPA standards. It is no secret that The Joint Commission has required the use of NFPA 101 for hospitals for decades. For this agency to change from using NFPA 101 to the IBC, drastic changes in the perception of the IBC and ease of its use for hospitals are needed.

Cost Impact: There is no cost impact for these changes as the industry has been using similar guidelines for many years as within the proposed changes through The Joint Commission regulations.

G32-12
PART I – IBC – G

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G35 – 12
202, 308.3, 308.4 (IFC [B] 202)

Proponent: Jerry Rosendahl, President, National Association of State Fire Marshals (jerry.rosendahl@state.mn.us)

Revise as follows:

308.3 Institutional Group I-1. This occupancy shall include buildings, structures or portions thereof for more than 16 persons who reside on a 24 hour basis in a supervised environment and receive *custodial care*. The persons receiving care are capable of self preservation. This group shall include, but not be limited to, the following:

Alcohol and drug centers
Assisted living facilities <u>with residents capable of self preservation</u>
Congregate care facilities
Convalescent facilities
Group homes
Halfway houses
Residential board and *custodial care* facilities
Social rehabilitation facilities

308.4 Institutional Group I-2. This occupancy shall include buildings and structures used for *medical care* on a 24-hour basis for more than five persons who are *incapable of self preservation*. This group shall include, but not be limited to, the following:

Foster care facilities
Detoxification facilities
Hospitals
Nursing homes
Psychiatric hospitals
<u>Assisted living facilities</u> <u>with residents incapable of self preservation</u>

Revise as follows:

<u>ASSISTED LIVING FACILITIES</u><u>. Custodial care congregate residential settings that provide or coordinate personal and health care services, 24-hour supervision, and assistance (scheduled and unscheduled) for the *health care maintenance* of adults who are aged, infirm or disabled and who are cared for in a primarily residential setting.</u>

<u>HEALTH CARE MAINTENANCE.</u> <u>The protection, general supervision and oversight of the physical and mental well-being of an aged, infirm or disabled individual. Residents may or may not need assistance to evacuate.</u>

CUSTODIAL CARE. Assistance with day-to-day living tasks; such as assistance with cooking, taking medication, bathing, using toilet facilities and other tasks of daily living. Custodial care include<u>s</u> occupants who evacuate at a slower rate and/or who have mental and psychiatric complications<u>.</u> ~~,~~ an<u>d may be incapable of self preservation.</u>

Reason: The current code language limits I-2 to only medical care facilities, which in itself would be in conflict with foster child care facilities. There are many facilities housing residents incapable of self-preservation that are not medical facilities by state definitions. This represents a huge gap in the code. With I-2 as a classification for only those facilities providing medical care and I-1 for only those capable of self-preservation, the IBC has no classification for a facility in which residents are under the care, supervision, protection or under the responsible care of the facility operator, and who are not capable of self-preservation. We do not object to what the CTC committee is attempting to do, but the CTC should recognize that the code certainly should be clear about the protection required for all individuals who are under the care of others and develop provisions that will protect all individuals. In

order to make the proper distinction and close the code's gap, the definition of "assisted living facilities" is offered. The phrase "health care maintenance" appears only in the definition of "assisted living facilities".

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

G35-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G54– 12
404.5, 712.1.8

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Healthcare and Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee (CTC)

Revise as follows:

404.5 Smoke control. ~~A~~ In other than Group I-2. smoke control system shall be installed in accordance with Section 909.

Exception: Smoke control is not required for *atriums* that connect only two *stories*.

712.1.8 Two-story openings. In other than ~~Groups I-2 and~~ Group I-3, a floor opening that is not used as one of the applications listed in this section shall be permitted if it complies with all of the items below.

1. Does not connect more than two stories.
2. Does not contain a stairway or ramp required by Chapter 10.
3. Does not penetrate a horizontal assembly that separates fire areas or smoke barriers that separate smoke compartments.
4. Is not concealed within the construction of a wall or a floor/ceiling assembly.
5. Is not open to a corridor in Group I and R occupancies.
6. Is not open to a corridor on nonsprinklered floors.
7. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx This proposal is being co-sponsored by the ICC Code Technology Committee.

This proposal is intended to correct a misapplication of the intent of the code and coordinate with federal requirements. Currently the language in Section 404.5 and 404.6 would allow a two story atrium to be open to the floors without providing a smoke control system or any passive separation. While this may be appropriate for many occupancy groups, exposing patients who are incapable of self preservation to a large vertical opening is an unacceptable risk. Practically, this would never occur because federal requirements that fund and regulate these types of facilities would not allow an opening without either smoke control or passive separation.

Two story vertical openings are design features that hospitals typically employ to create a more calming and welcoming environment for the patients and their families. The intent of the code appears to allow multiple methods for dealing vertical openings. The AHC believed that a reasonable solution was to restrict the unprotected atrium language and concurrently add language to allow the use of two story openings in 712.1.8. This trade off would protect the corridor from the large opening between floors. It would also provide facilities and designers two options for dealing with these openings.

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

G54-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G55 – 12
404.5

Proponent: Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee (CTC)

Revise as follows:

404.5 Smoke control. ~~A~~ In other than Group I-2 and Group I-1. Condition 2, smoke control system shall be installed in accordance with Section 909.

Exception: Smoke control is not required for *atriums* that connect only two *stories*.

Reason: The Adhoc Healthcare committee has a proposal to require smoke control for 2 story atriums in Group I-2 due to concerns about smoke compartmentation. The CTC care committee would like to include the new Group I-1, Condition 2 based on the same theory of protection.

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 twenty-two meetings – all open to the public.

Cost Impact: The proposed changes will not increase the cost of construction.

G55-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G77 – 12
IBC 407.9 (NEW), IFC 604.2.1.6 (NEW) [IBC [F] 2702.2.17 (NEW)]

Proponent: Robert W. Jenkins, Chesterfield Fire & EMS, representing self (jenkinsr@chesterfield.gov)

Add new text as follows:

407.9 Emergency power. A minimum of 96-hours of emergency power shall be provided to the essential electrical systems in Group I-2 hospitals and nursing homes. Emergency power shall be connected to the life safety branch and the critical branch defined in NFPA 70, and further defined as emergency power supply systems in Chapter 4 of NFPA 110.

Add new text as follows:

IFC 604.2.16 (IBC [F] 2702.2.17) Group I-2 Occupancies. Emergency power shall be provided in Group I-2 hospitals and nursing homes in accordance with Section 407.9 of the *International Building Code*.

Reason: Group I-2 facilities are defend in place occupancies where occupants are usually not relocated. NFPA 110, Chapter 5 requires 96-hours of fuel supply for a Level 1 EPSS Class X system when located in seismic design category C, D, E or F. Time frames for emergency power supplies need to be adjusted to allow facilities adequate time to maintain fuel supplies to secondary power sources. Our jurisdiction has had a power loss for several days due primarily to hurricane remnants on the east coast, such as hurricane Isabel in 2003. Power was not restored to several areas from as little as five days to a maximum of 30-days.

Cost Impact: The code change proposal will increase the cost of construction. Cost increase will be incurred due to additional fuel storage requirements and/or type of secondary sources.

G77-12

Public Hearing:	Committee:	AS	AM	D	
	Assembly:	ASF	AMF	DF	

G130 – 12
Table 509

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

Revise as follows:

TABLE 509
INCIDENTAL USES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input.	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen cutoff rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic sprinkler system
In Group E occupancies, laboratories and vocational shops~~,~~ not classified as Group H~~, located in Group E or I-2 occupancy~~	1 hour or provide automatic sprinkler system
In Group I-2 occupancies, laboratories not classified as Group H	1 hour and provide automatic sprinkler system
In ambulatory care facilities, laboratories not classified as Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
In Group I-2, laundry rooms over 100 square feet	1 hour
Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces	1 hour
In Group I-2**,** physical plant maintenance shops.	1 hour
In ambulatory care facilities or Group I-2 occupancies , waste and linen collection rooms ~~located in either Group I-2 occupancies or ambulatory care facilities~~ with containers that have an aggregate volume of 10 cubic feet or greater	1 hour
In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than 100 square feet	1 hour
Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons for flooded lead-acid, nickel cadmium or VRLA, or more than 1,000 pounds for lithium-ion and lithium metal polymer used for facility standby power, emergency power or uninterruptable power supplies	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.

For SI: 1 square foot = 0.0929 m^2, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L.

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx This proposal is being co-sponsored by the ICC Code Technology Committee.

Currently, more detail is needed in the Incidental Use table to add spaces currently being maintained in healthcare and ambulatory care occupancies. The above chart makes the noted tables consistent with current operational and programmatic standards in the Group I-2 occupancy.

The current version of the table does not address the occasion when materials in a laboratory increases, most notably in the aggregate of larger histology / cytology laboratories. Materials such as xylene, hydrochloric acid, ethanol and fixatives (among others) are present in these areas. Although they are stored in gallon and liter quantities, and not bulk storage, the quantities add up over the larger lab control areas when they are in use at the benches.

The distinction between smaller stat labs, largely found in ambulatory care facilities, and larger clinical labs, found in hospitals, is being proposed. Ambulatory care facilities has been added to the current laboratory category to address those support spaces such as stat labs that are set up for a specific time-sensitive purpose, such as blood draw and chemotherapy, to save time in the Group B occupancy setting. Larger scale or non-critical lab operations are typically sent out to proprietary labs from ambulatory facilities. When addressing labs crossing the threshold into one hour rated construction, these labs are typically constructed as stand-alone operations and commonly appear in Group B occupancies, and are subject to the current occupancy separation requirements.

Volume thresholds are being considered in waste and linen collection rooms because basic exam spaces contain some level of waste containers and linen hampers without rising to the level of storage. The 10 cubic foot threshold represents essentially two medium sized linen hampers and/or trash receptacles. Larger linen and waste receptacle containers, and not the smaller containers typically found in an exam room or patient sleeping room, are subject to volume rather than square footage of the room because a relatively small space, with the 10 cubic foot threshold crossed in a space well below, for example, 100 square feet.

Group I-2 is also being added to the requirement for one hour rating with rooms equipped with padded surfaces. The instance of these rooms existing in a hospital is rare. It is prudent, however, to add the requirement where there is the occasion that such rooms are used in areas such as emergency departments, inpatient psychiatric units, or similar areas.

Physical plant and maintenance shops are a very specific function in a hospital building, and are being added to the table to ensure protection due to the stored materials related to the physical plant operation.

Addition of storage rooms as an area requiring 1 hour rated protection is a key functional aspect of a Group I-2 healthcare building. Areas that become unused become storage areas very quickly. Specifically calling out storage areas helps define and control the storage of combustibles, and avoid creating random storage in otherwise unmonitored or unprotected areas.

Areas addressed in the past, but are no longer included in the table, are addressed in the International Fire Code (IFC). For example, storage of combustible gases is addressed in IFC Section 5306.2 and has specific references to the Group I-2 occupancy. Gift shops, formerly listed as an incidental area requiring protection, have largely been eliminated from these requirements in the I-Codes and other model codes, and are addressed in the context of being open to the corridor.

In consideration of ambulatory care facilities, where not otherwise specifically called out, categories that are required for both Group B and I occupancies are assumed to cover Group I-2 and ambulatory care facilities. Examples of this interpretation are hydrogen cut-off rooms and stationary battery storage.

Cost Impact: The code change proposal will increase the cost of construction in facilities where the incidental uses occur.

G130-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

M36-12

401.2, Table 403.3; 407 (New); Chapter 15, IBC 1203.1

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care and Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

THIS IS A 2 PART CODE CHANGE, BOTH PARTS WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

PART I – IMC

Revise as follows:

Section 401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2-inch water column (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403. Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407.

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1,000 FT² [a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT² [a]	EXHAUST AIRFLOW RATE CFM/ FT² [a]
Food and Beverage Service				
Bars, cocktail lounges	100	7.5	0.18	--
Cafeteria, fast food	100	7.5	0.18	--
Dining rooms	70	7.5	0.18	--
Kitchens (cooking) [b]	--	--	--	0.7
~~**Hospitals, Nursing and convalescent homes**~~				
~~Autopsy rooms~~ [b]	~~--~~	~~--~~	~~--~~	~~0.5~~
~~Medical procedure rooms~~	~~20~~	~~15~~	~~--~~	~~--~~
~~Operating rooms~~	~~20~~	~~30~~	~~--~~	~~--~~
~~Patient rooms~~	~~10~~	~~25~~	~~--~~	~~--~~
~~Physical therapy~~	~~20~~	~~15~~	~~--~~	~~--~~
~~Recovery and ICU~~	~~20~~	~~15~~	~~--~~	~~--~~
Hotels, motels, resorts and dormitories				
Multipurpose assembly		5	0.06	--
Bathrooms/toilets-private[g]		--	--	25/50[f]

(Portions of table and footnotes not shown remain unchanged)

Add new text as follows:

SECTION 407
AMBULATORY CARE FACILITIES AND GROUP I-2 OCCUPANCIES

Section 407.1 General. Mechanical ventilation for ambulatory care facilities and Group I-2 occupancies shall be designed and installed in accordance with this code and ASHRAE 170.

Add new referenced standard to Chapter 15:

ASHRAE

Standard Reference Number	Title	Referenced in code section number
170-2008	Ventilation of Health Care Facilities (with addendums a through h – 2011)	407.1

PART II- IBC GENERAL

Revise as follows:

1203.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *International Mechanical Code*. Where the air infiltration rate in a *dwelling unit* is less than 5 air changes per hour when tested with a blower door at a pressure 0.2 inch w.c. (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the *dwelling unit* shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code*. Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407 of the *International Mechanical Code.*

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx. This proposal is being co-sponsored by the ICC Code Technology Committee. 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 twenty-two meetings – all open to the public.

Currently Table 403.3 if the IMC has a limited number of spaces identified with ventilation rates, additionally if a room is not identified in the table then one is required to use the ventilation rate of an adjacent room that is on the list which is problematic if the space usage is vastly different. ASHRAE Standard 170, Table 7-1 has more comprehensive in the spaces that are identified as well as the design parameter requirements. Facility Guidelines Institute (FGI) has also incorporated ASHRAE 170 into the ventilation design requirements at health care facilities. ASHRAE 170 is similar in nature to the IMC referenced standard for the International Institute for Ammonia Refrigeration.

Cost Impact: The code change proposal should not increase the cost of construction because compliance with the standard is already required by facility licensure requirements.

Analysis: A review of the standard proposed for inclusion in the code, [ASHRAE170-2008] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M36-12

PART I – INTERNATIONAL MECHANICAL CODE

Public Hearing:	Committee:	AS	AM		D
		Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL BUILDING CODE

Public Hearing:	Committee:	AS	AM		D
		Assembly:	ASF	AMF	DF