Public Comment:

Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee, requests Approval as Modified by this public comment.

Modify proposal as follows:

903.6.2 Group I-1. An automatic sprinkler system in accordance with Section 903.3.1.1 shall be ~~installed throughout all existing buildings with a fire area containing a Group I-1 occupancy~~ provided throughout the floor where the Group I-1 occupancy is located, and in all floors between the Group I-1 occupancy and the level of exit discharge.

~~**903.6.3 Group I-2.** An automatic fire sprinkler system in accordance with Section 903.3.1.1 shall be installed throughout all existing buildings with a fire area containing a Group I-2 occupancy.~~

Commenter's Reason: This proposal recognizes the need to provide fire sprinkler protection for some of the existing Group I occupancies. These facilities have a high potential for life loss and contain patients/clients who are incapable of self-preservation.

A new Group I-1 occupancy would be required to be protected by fire sprinklers in addition to other construction requirements. This proposal does not mandate compliance with current code, however, it does require fire sprinklers in existing Group I-1 occupancies where the life safety of the patients is most in need.

In 2005, Kimberly D. Rohr and John R. Hall, Jr., of the Association's Fire Analysis and Research Division presented startling statistics regarding the efficacy of automatic extinguishing equipment. The data examined was for the years 1989 to 1998 (the last year for which good data on sprinklers is available) and measured the average number of civilian deaths per thousand fires in various types of facilities. In stores and offices the figures were 1.0 to 0.3 respectively; in health care facilities for the aged or sick 4.9 per thousand fires in non-sprinklered buildings compared to 1.2 in those that were protected with fire sprinklers. There was also a significant decline in property damage costs per fire; down 66 percent in health care occupancies when the facility is protected by a fire sprinkler system.

Even though the sprinkler requirements for I-2 are shown as stricken, they are still retained and are only stricken in this Public Comment. The Code Development Committee disapproved Item F153 07-08 in favor of the wording in Item F154 07-08. This Public Comment has been revised to be consistent with the wording and provisions approved in Item F154. Therefore, this Public Comment only affects I-1 occupancies and will be limited to application of the I-1 occupancy and floor levels between the I-1 and the level of exit discharge, rather than the entire building.

Final Action: AS AM AMPC____ D

F155-07/08
903.6.2 (New)

Proposed Change as Submitted:

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

Add new text as follows:

903.6.2 Group R-4. An automatic sprinkler system installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3 shall be provided throughout all existing buildings with a Group R-4 fire area.

Reason: The IFC does not contain requirements for existing Group R-4 occupancies. However, these facilities can house clients that have limited capabilities for self-evacuation.

One other solution would be to restrict residents in Group R-4 occupancies only to those who can evacuate without assistance. Those clients not capable of self-evacuation would be placed into an I occupancy. This solution brings with it many more requirements than sprinklers and is more restrictive than necessary. Therefore, the installation of fire sprinklers in the existing Group R-4 occupancies provides a mitigation to the other hazards present and allows for extended evacuation times.

The problem created by only placing clients capable of self-evacuation into Group R-4 is that as the client continues to live in the facility and loses mobility, the resident at some point is no longer capable of self-evacuation. This would result in having to relocate after living in a facility many times for years.

The solution of installing fire sprinklers into the existing facilities mitigates many of the issues and provides a safe environment for the clients.

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

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that the proposal is not needed since Group R-4 occupants are capable of self-preservation and that Group R-4 buildings can be built without sprinklers under the IRC. The proposal would create conflict with the IRC in that if that is the code the Group R-4 is built to without sprinklers, it would immediately be in violation of the proposed requirement in this proposal.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee, requests Approval as Submitted.

Commenter's Reason: The IFC does not contain requirements for existing Group R-4 occupancies. However, these facilities can house clients that have limited capabilities for self-evacuation. The definition of Assisted Living specifies that the occupants are capable of **responding** to an emergency situation. The ability to respond places no requirement on how long they take to evacuate, or they capability during that evacuation. Therefore, the installation of fire sprinklers in the existing Group R-4 occupancies provides mitigation to hazards present and allows for extended evacuation times.

Many clients are placed in Group R-4 at a time when the client is quite capable of self-evacuation. As the client continues to live in the facility, mobility is reduced and at some point the client has limited capability of self-evacuation.

The solution of installing fire sprinklers into the existing facilities mitigates many of the issues and provides a safe environment for the clients. This Public Comment will also provide consistency with mandated Federal Regulations for R-4 occupancies. In other words, the Federal Regulations require sprinklers. If the IFC contains this requirement, it will eliminate confusion and frustration on the part of the owner/developer and eliminate finger pointing after the code official has "approved" the facility.

Final Action: AS AM AMPC____ D

F162-07/08
907.2 (IBC [F] 907.2)

Proposed Change as Submitted:

Proponent: Jeffrey M. Shapiro, PE, International Code Consultants, representing National Multi Housing Council

Revise as follows:

907.2 (IBC [F] 907.2) (Supp) Where required - new buildings and structures. An approved manual, automatic or manual and automatic fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through 907.2.22 and provide occupant notification in accordance with Section 907.6, unless other requirements are provided by another section of this code.

A minimum of one manual fire alarm box shall be provided in an approved location to initiate a fire alarm signal for
fire alarm systems employing automatic fire detectors or waterflow detection devices. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, a single fire alarm box shall be installed.

Exceptions:

1. The manual fire alarm box is not required for fire alarm systems dedicated to elevator recall control and supervisory service.
2. The manual fire alarm box is not required for Group R-2 occupancies.

Reason: Manual fire alarm boxes in apartment occupancies invite tampering and false alarms, and there is no apparent fire safety benefit to be gained by placing a single fire alarm box in such occupancies.

Justification offered last year to substantiate the need for the single manual alarm box was that it might be needed by a sprinkler technician to initiate an alarm if sprinklers/waterflow switches are out of service, but this makes no sense. Assuming that the alarm box is located in the valve room to avoid making it available to vandals, a technician working on any part of the sprinkler system, other than the valve, would be far away, and may or may not even know where the alarm box is. If the box were to be located where it will be accessible for occupant use, it is difficult to believe that occupants would know the location of a single pull box in a building or that they would seek out the box to initiate an alarm if the waterflow switch failed.

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

Committee Action: **Approved as Modified**

Modify the proposal as follows:

907.2 (IBC [F] 907.2) (Supp) Where required - new buildings and structures. An approved manual, automatic or manual and automatic fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through 907.2.22 and provide occupant notification in accordance with Section 907.6, unless other requirements are provided by another section of this code.

A minimum of one manual fire alarm box shall be provided in an approved location to initiate a fire alarm signal for fire alarm systems employing automatic fire detectors or waterflow detection devices. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, a single fire alarm box shall be installed.

Exceptions:

1. The manual fire alarm box is not required for fire alarm systems dedicated to elevator recall control and supervisory service.
2. The manual fire alarm box is not required for Group R-2 occupancies unless required by the fire code official to provide a means for fire watch personnel to initiate an alarm during a sprinkler system impairment event. Where provided, the manual fire alarm box shall not be located in an area that is accessible to the public.

Committee Reason: The proposal was approved because the committee agreed that the manual fire alarm box should not be provided in Group R-2 where false alarms are a problem. The modification avoids putting the manual fire alarm box in all Group R-2 occupancies where there could be a false alarm problem while leaving open the option for the fire code official to require one in a restricted location for use by fire watch personnel, if needed.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Steve Orlowski, National Association of Home Builders, requests Disapproval.

Commenter's Reason: The intent of the proposal was to exclude the requirements for the manual fire alarm box in R-2 occupancies where false alarms are a problem. While the modification does attempt to locate the manual alarm box in an area that is inaccessible to the public, except for hotels and motels, most of the other occupancies classified as an R-2 do not contain areas that is not accessible to the public or to the occupants. Furthermore, in the event that the automatic sprinkler system is impaired or not in service, these structures are still required to be equipped and protected with a single- and multi-station smoke alarms that will detect and notify all occupants that there is a hazard and should begin evacuating the building.

Final Action: AS AM AMPC____ D

F170-07/08, Part I

907.2.12.1, 907.2.12.1.1 (New), 907.2.12.1.2 (New), 907.4.2 (New) [IBC [F] 907.2.12.1, [F] 907.2.12.1.1 (New), [F] 907.2.12.1.2 (New), [F] 907.4.2 (New)]

Proposed Change as Submitted:

Proponent: David Frable, U.S. General Services Administration

PART I – IFC

1. Revise as follows:

907.2.12.1 (IBC [F] 907.2.12.1) (Supp) Automatic fire detection. ~~Smoke~~ Detectors shall be provided in accordance with this section. ~~Smoke detectors shall be connected to an automatic fire alarm system. The activation of any detector required by this section shall operate the emergency voice/alarm communication system. Smoke detectors shall be located as follows:~~

907.2.12.1.1 (IBC [F] 907.2.12.1.1) Area detection. ~~1.~~ Smoke detectors shall be installed in each mechanical equipment, electrical, transformer, telephone equipment or similar room which is not provided with sprinkler protection, elevator machine rooms, and in elevator lobbies.

Exception: Heat detectors shall be permitted to be installed in lieu of smoke detectors where the ambient conditions of the space preclude the effective operation of smoke detectors.

907.2.12.1.2 (IBC [F] 907.2.12.1.2) Air handling system detection Smoke detectors serving air handling systems shall comply with Section 907.4.2 and be installed as follows:

1. In the main supply air duct of each air-handling system having a design capacity greater than 2,000 cubic feet per minute (cfm) (0.94 m^3/s), downstream of any filters.

2. In the main return ~~air and exhaust air plenum~~ of each air-~~conditioning~~ handling system having a design capacity greater than ~~2,000~~ 15,000 cubic feet per minute (cfm) ~~(0.94 m^3/s)~~(7.1 m^3/s). Such detectors shall be located in a serviceable area downstream of the last duct inlet.

   Exception: Smoke detectors are not required in the return air system where all portions of the building served by the air distribution system are protected by area smoke detectors connected to a fire alarm system.

3. In the return air system where multiple air-handling systems share common or supply return air ducts or plenums with a combined design capacity greater than 15,000 cfm (7.1 m^3/s),

   Exception: Smoke detectors are not required in the return air system where all portions of the building served by the air distribution system are protected by area smoke detectors connected to a fire alarm system.

4. At each story in return air systems having a design capacity greater than 15,000 cfm (7.1 m^3/s), where return air risers serve two or more stories.

   Exception: Smoke detectors are not required in the return air system where all portions of the building served by the air distribution system are protected by area smoke detectors connected to a fire alarm system.

~~3.~~ 5. At each connection to a vertical duct or riser serving two or more stories from a return air duct or plenum of an air-conditioning system with a design capacity of greater than 15,000 cfm (7.1 m^3/s). In Group R-1 and R-2 occupancies, a smoke detector is allowed to be used in each return-air riser carrying not more than 5,000 cfm (2.4m^3/s) and serving not more than 10 air-inlet openings.

   Exception: Smoke detectors are not required in the return air system where all portions of the building served by the air distribution system are protected by area smoke detectors connected to a fire alarm system.

2. Add new text as follows:

907.4.2 (IBC [F] 907.4.2) Controls operation. Upon activation, the smoke detectors shall shut down all operational capabilities of the air distribution system in accordance with the listing and labeling of appliances used in the system. Air distribution systems that are part of a smoke control system shall switch to the smoke control mode upon activation of a detector.

Reason: The intent of this proposal is improve the level of detection of smoke within air handling units and to correlate smoke detector requirements in air handling systems in the IBC, IFC and IMC with the requirements currently found in NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

During the 2006/2007 ICC Code Development Hearings in Orlando, both the Fire Code Committee and Mechanical Code Committee recommended approval of two similar code change proposals (F113-06/07 – Part 1& Part 2). However, at the Final Action Hearings of the ICC in May 2007, the ICC membership voted to overturn both the Fire Code Committee and the Mechanical Code Committee's recommendations and disapproved the subject code change proposals. At the hearings, no new information or technical substantiation was brought forth to substantiate overturning the two Code Committee's recommendations for approval. It should be emphasized that the main issue of contention by the opponents of this code change proposal at both the Code Committee and Final Action Hearings was that this issue had been debated many times before in the ICC Code Development Process. However, that is untrue. To the best of our knowledge, only one attempt has formally been made to change the current I-Code requirements regarding this issue, and that was during the 2006/2007 ICC Code Development Cycle.

The technical substantiation to revise the location of smoke detectors from the return air side to the supply air side is valid; and will improve the level of detection of smoke within air-handling units. Opponents may argue that return air detectors will detect fires in a building much quicker than detectors located on the supply air side. **Note**: return air detectors are not a substitute for area detectors; if there is a desire for early detection of smoke, area smoke detectors should be installed. However, we contend that the detector serving the supply air detector will operate as desired once the smoke concentration levels in the supply air exceeds the alarm threshold so occupants should not be at risk should the return air fan continues to run prior to the supply air fan shutting down. In addition, return air detectors will not be able to detect smoke from a fire on the supply side of air handling units due to fan belts, motors or combustible filters so their respective fan will shut off appropriately. A smoke detector located on the supply side can also detect smoke from an exterior fire that gets pulled into the fresh air intake for the air handling system. Thus, a smoke detector located on the supply side will serve the purpose of protecting building occupants from smoke produced by air handling unit fire or smoke ingress via the fresh air intake for the air handling unit and provides the ability to detect more fires than return air detectors. Therefore overall detection is improved.

Correlating the IFC, IBC and IMC with NFPA 90A is also important as many jurisdictions adopt both the IFC/IMC and NFPA 90A. Accredited health care organizations are required by law to comply with NFPA 90A. Not having the subject requirements in the IBC in concert with NFPA 90A results in the unnecessary installation of smoke detectors in both the return and supply air systems. This code change proposal aims to maintain detection in air handling systems, not remove it. There should be no increase in installation costs as this code change proposal merely shifts the location of devices from the return air side to the supply air side, where air handling units are greater than 2000 cfm. In fact, changing the requirement as proposed will reduce the cost in jurisdictions that must comply with the IFC/IMC and NFPA 90A (i.e., leaving the requirements as currently stated in both the IFC and IMC already results in unnecessary additional costs).

Specific code changes are as follows:

PART 1:
(Deleted text) IFC 907.2.12.1. a. Since the title of this section is (and has always been) "automatic fire detection", the term "smoke" has been deleted to offer the opportunity to install other types of detectors as the situation requires. Though there are no current or proposed requirements for other types of detectors, it is better to have a place holder just in case. b. All text requiring detectors to activate the fire alarm system or voice system has been deleted since it is redundant. See 907.6 and 907.6.2.2.

(new) IFC 907.2.12.1.1 and 907.2.12.1.2. New sections have been inserted to distinguish between area detectors required for certain applications (e.g., elevator lobbies, electrical rooms, etc.) and detectors required to serve air handling systems.

(new) Exception to IFC 907.2.12.1.1. The new exception has been added to permit the installation of heat detectors in place of smoke detectors in those locations where smoke detectors would not operate effectively (e.g., unheated elevator lobbies in parking garages where temperatures may be subject to freezing and unenclosed or partially enclosed elevator lobbies where detectors may be subject to wind or high humidity).

(new) 907.2.12.1.2 and 907.4.2. Added the requirement for smoke detectors serving air handling systems to shut down their respective air handling system, as currently required by the IMC. Text proposed is the same as currently contained in IMC 606.4.

(new) IFC 907.2.12.1.2, paragraph 1 and IMC 606.2.1
Over the past few years, the U.S. General Services Administration has had a number of fire incidences that did not activate the building fire alarm system because there were no smoke detectors installed in the main supply air duct of the air-handling system downstream of any filter. Conversely, GSA has no incidence of a return air duct smoke detector activating as a result of detecting smoke in the return air handling system. Installing duct smoke detectors in the supply air system would ensure that fires within the supply air filters or in the air handling motors can be discovered before it spreads. Establishing a 2,000 cfm threshold for installing detectors in supply air fans appears to be an industry standard.

(revision/new) 606.2.1 and 606.2.2 (changed to 606.2.2 and 606.2.3, respectively) and (new) 907.2.12.1.2, paragraphs 2 & 3 (Note: the intent is for 907.2.12.1.2 to be have similar language as 606.2.2 and 606.2.3 so the codes are coordinated). The current requirement for installing smoke detectors in return air systems exceeding 2,000 cfm is overly restrictive. The 15,000 cfm threshold for return air systems appears to be an industry standard, as this capacity was used in the legacy codes and is currently used by NFPA 90A. The term "air conditioning system" has been replaced with "air handling system to more accurately reflect the type of system used in buildings today. (deleted text) Requiring smoke detectors in exhaust air plenums does not provide any protection for the fan or the building occupants, since smoke is being exhausted out of the building. In addition, return air smoke detection is not supposed to be used as a means for detecting smoke in buildings.

(new) IFC 907.2.12.1.2, paragraph 4 is material extracted from IMC existing 606.2.3 (changed to 606.2.4).
This is an editorial change to coordinate the two codes.

(revision) 907.2.12.1.2 Paragraph No. 5 (formally Paragraph No. 3) – The purpose of this code change is to correlate this paragraph with the changes above. The code language contained in the IBC does not have a capacity threshold for return air ducts/plenum with connections to more than two stories and, therefore, all return duct/plenum system that connects more than two floors would require duct mounted smoke detectors at the connection to the riser regardless of the size of the system. This would be onerous to smaller buildings that have multi-story returns. In addition, no other code (either the legacy codes or NFPA 90A require smoke detectors in multi-story return air systems unless they exceeded 15,000 cfm. This change also would correlate the capacity requirements currently specified in NFPA 90A - 2002 edition (NFPA 90A – 6.4.2).

(new) Exception to IFC 907.2.12.1.2 (2) through (5) is material extracted from the IMC existing exception to 606.2.1 (changed to 606.2.2) that eliminates the need for smoke detectors in return air systems when the entire building is protected by area smoke detectors.

PART I – IFC
Committee Action: Disapproved

Committee Reason: The proposal was disapproved for consistency with the IMC committee action on Part II. The committee felt that there is no justification for the change, especially since it was just changed to the current text in the last cycle.

Assembly Action: None

Individual Consideration Agenda

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

Public Comment:

Dave Frable, U.S. General Services Administration, requests Approval as Submitted for Part I.

Commenter's Reason: To say the least, the U.S. General Services Administration is disappointed with the reason statement provided by the 07/08 Fire Code Committee and Mechanical Code Committee for disapproval of this specific code change at the Code Development Hearings in Palm Springs, CA. The ICC Code Committees are the foundation upon which the process of development of the *ICC International Codes* is built and their importance cannot be overemphasized. In addition, it is essential that all ICC Code Committees prepare in advance, prior to their participation during the Code Development Hearings.

At the Code Development Hearings in Rochester, NY the Committee's reason statement for "Approval as Submitted" code change F113-06/07 Part I and Part II stated the following:

F113-06/07, Part I
907.2.12.1 (IBC [F] 907.2.12.1)
"Committee Reason: Based on the proponent's reason statement. The proposal will provide correlation with the IMC and improve the level of protection against filter fires in air-handling systems. The threshold values will better correlate with the IMC and NFPA 90A as well as return them to the level of the legacy codes."

F113-06/07, Part II
IMC 606.2 through 606.2.4
"Committee Reason: This proposed change will correlate with the requirements found in NFPA 90A, resulting in only requiring a smoke detector in the supply duct. Many jurisdictions use both NFPA 90A and the I-codes which causes contractors to have to install detectors in both the return and supply ducts. This will alleviate that problem. The proponent cited many examples where the detector failed to shut down the fans because the fire was in the filter and the detector was in the return. The committee also wanted to be consistent with the action taken by the Fire Code committee."

However, in the Code Development Hearings in Palm Springs, CA, the Fire Code Committee's reason statement in F170-07/08, it states that the main reason for disapproval was that "the committee felt that there is no justification for the change, especially since it was just changed to the current text in the last cycle" and that "some of the language does not coincide with NFPA 90A as claimed by the proponent" even though the Committee's reason statement in 06/07 for "approval as submitted" contradicts the Committee's reason statement for "disapproval" in 07/08.

Unfortunately, it appears the 07/08 Committee's did not meet their responsibilities as Committee members to prepare in advance prior to participating in the Code Development Hearings and has stated in accurate information in the Committee's reason statement. For example, the 07/08 Fire Code Committee states that one of their main reasons for disapproval was that the current text was change last cycle. This is an incorrect statement. The current code text has not been changed since the 2000 IFC. In addition, the Mechanical Code Committee states that one of their reasons is that the proposed revised code text does not correlate with NFPA 90A. This is also an inaccurate statement.

The overall intent of this code change is to improve the level of smoke detection within air-handling systems and to correlate the smoke detection requirements within the IFC, IMC, & NFPA 90A in a cost-effective manner. To improve the level of detection of smoke within air-handling systems, we have revised the location of detection from the return side to the supply side of the air handling systems. We believe fires on the supply air side of HVAC units due to fan belts, motors or combustible filters will be detected much quicker and fans will shut off appropriately. In addition, any smoke from a fire that travels in a return air duct will still be detected by the supply side duct smoke detector. A supply duct smoke detector could also pick up an exterior fire that gets pulled into the air handling system. Last but not least, we also believe that the current requirement for installing smoke detectors in return air systems exceeding 2,000 cfm is overly restrictive and seems to be completely opposite of what had been required by two of the three legacy codes (i.e., UBC and BOCA) and what is currently being required in NFPA 90A. In addition, correlating the IFC, IBC and IMC with NFPA 90A is also important as many jurisdictions adopt both the IFC/IMC and NFPA 90A. Accredited health care organizations are required by law to comply with NFPA 90A. Not having the subject requirements in the IBC in concert with NFPA 90A results in the unnecessary installation of smoke detectors in both the return and supply air systems. This code change proposal aims to maintain detection in air handling systems, not remove it. There should be no increase in installation costs as this code change proposal merely shifts the location of devices from the return air side to the supply air side, where air handling units are greater than 2000 cfm. In fact, changing the requirement as proposed will reduce the cost in jurisdictions that must comply with the IFC/IMC and NFPA 90A (i.e., leaving the requirements as currently stated in both the IFC and IMC already results in unnecessary additional costs).

Therefore based on these concerns, we urge the membership to approve this code change as submitted.

Final Action: AS AM AMPC____ D

F170-07/08, Part II
IMC 606.2, 606.2.1 (New), 606.2.2, 606.2.3

Proposed Change as Submitted:

Proponent: David Frable, U.S. General Services Administration

PART II – IMC

606.2 Where required. Smoke detectors shall be installed where indicated in Sections 606.2.1 through ~~606.2.3~~ 606.2.4.

Exception: Smoke detectors shall not be required where air distribution systems are incapable of spreading smoke beyond the enclosing walls, floors and ceilings of the room or space in which the smoke is generated.

606.2.1 Supply air systems. Smoke detectors shall be installed in supply air systems with a design capacity greater than 2,000 cubic feet per minute (cfm) (0.94 m^3/s), in the supply air duct or plenum downstream of any filters.

~~**606.2.1**~~ **606.2.2 Return air systems.** Smoke detectors shall be installed in return air systems with a design capacity greater than ~~2,000~~ 15,000 cfm (~~0.9~~ 7.1m^3/s), in the return air duct or plenum upstream of any filters, exhaust air connections, outdoor air connections, or decontamination equipment and appliances.

Exception: Smoke detectors are not required in the return air system where all portions of the building served by the air distribution system are protected by area smoke detectors connected to a fire alarm system in accordance with the *International Fire Code*. The area smoke detection system shall comply with Section 606.4.

~~606.2.2~~ 606.2.3 Common supply and return air systems. Where multiple air-handling systems share common supply or return air ducts or plenums with a combined design capacity greater than ~~2,000~~ 15,000 cfm (~~0.9~~ 7.1 m^3/s), the return air system shall be provided with smoke detectors in accordance with Section ~~606.2.1~~ 606.2.2.

~~**Exception:** Individual smoke detectors shall not be required for each fan-powered terminal unit, provided that such units do not have an individual design capacity greater than 2,000 cfm (0.9 m^3/s) and will be shut down by activation of one of the following:~~

~~1. Smoke detectors required by Sections 606.2.1 and 606.2.3.~~
~~2. An approved area smoke detector system located in the return air plenum serving such units.~~
~~3. An area smoke detector system as prescribed in the exception to Section 606.2.1~~.

In all cases, the smoke detectors shall comply with Sections 606.4 and 606.4.1.

~~606.2.3~~ 606.2.4 Return air risers. (No change to current text)

Reason: The intent of this proposal is improve the level of detection of smoke within air handling units and to correlate smoke detector requirements in air handling systems in the IBC, IFC and IMC with the requirements currently found in NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

During the 2006/2007 ICC Code Development Hearings in Orlando, both the Fire Code Committee and Mechanical Code Committee recommended approval of two similar code change proposals (F113-06/07 – Part 1& Part 2). However, at the Final Action Hearings of the ICC in May 2007, the ICC membership voted to overturn both the Fire Code Committee and the Mechanical Code Committee's recommendations and disapproved the subject code change proposals. At the hearings, no new information or technical substantiation was brought forth to substantiate overturning the two Code Committee's recommendations for approval. It should be emphasized that the main issue of contention by the opponents of this code change proposal at both the Code Committee and Final Action Hearings was that this issue had been debated many times before in the ICC Code Development Process. However, that is untrue. To the best of our knowledge, only one attempt has formally been made to change the current I-Code requirements regarding this issue, and that was during the 2006/2007 ICC Code Development Cycle.

The technical substantiation to revise the location of smoke detectors from the return air side to the supply air side is valid; and will improve the level of detection of smoke within air-handling units. Opponents may argue that return air detectors will detect fires in a building much quicker than detectors located on the supply air side. **Note**: return air detectors are not a substitute for area detectors; if there is a desire for early detection of smoke, area smoke detectors should be installed. However, we contend that the detector serving the supply air detector will operate as desired once the smoke concentration levels in the supply air exceeds the alarm threshold so occupants should not be at risk should the return air fan continues to run prior to the supply air fan shutting down. In addition, return air detectors will not be able to detect smoke from a fire on the supply side of air handling units due to fan belts, motors or combustible filters so their respective fan will shut off appropriately. A smoke detector located on the supply side can also detect smoke from an exterior fire that gets pulled into the fresh air intake for the air handling system. Thus, a smoke detector located on the supply side will serve the purpose of protecting building occupants from smoke produced by air handling unit fire or smoke ingress via the fresh air intake for the air handling unit and provides the ability to detect more fires than return air detectors. Therefore overall detection is improved.

Correlating the IFC, IBC and IMC with NFPA 90A is also important as many jurisdictions adopt both the IFC/IMC and NFPA 90A. Accredited health care organizations are required by law to comply with NFPA 90A. Not having the subject requirements in the IBC in concert with NFPA 90A results in the unnecessary installation of smoke detectors in both the return and supply air systems. This code change proposal aims to maintain detection in air handling systems, not remove it. There should be no increase in installation costs as this code change proposal merely shifts the location of devices from the return air side to the supply air side, where air handling units are greater than 2000 cfm. In fact, changing the requirement as proposed will reduce the cost in jurisdictions that must comply with the IFC/IMC and NFPA 90A (i.e., leaving the requirements as currently stated in both the IFC and IMC already results in unnecessary additional costs).

PART II:

(revision) 606.2. This is an editorial change to coordinate the two codes.

(new) IMC 606.2.1 and IFC 907.2.12.1.2, paragraph 1 (restated)

Over the past few years, the U.S. General Services Administration has had a number of fire incidences that did not activate the building fire alarm system because there were no smoke detectors installed in the main supply air duct of the air-handling system downstream of any filter. Conversely, GSA has no incidence of a return air duct smoke detector activating as a result of detecting smoke in the return air handling system. Installing duct smoke detectors in the supply air system would ensure that fires within the supply air filters or in the air handling motors can be discovered before it spreads. Establishing a 2,000 cfm threshold for installing detectors in supply air fans appears to be an industry standard.

(revision/new) 606.2.1 and 606.2.2 (changed to 606.2.2 and 606.2.3, respectively) and (new) 907.2.12.1.2, paragraphs 2 & 3 (Note: the intent is for 907.2.12.1.2 to be have similar language as 606.2.2 and 606.2.3 so the codes are coordinated). The current requirement for installing smoke detectors in return air systems exceeding 2,000 cfm is overly restrictive. The 15,000 cfm threshold for return air systems appears to be an industry standard, as this capacity was used in the legacy codes and is currently used by NFPA 90A. The term "air conditioning system" has been replaced with "air handling system to more accurately reflect the type of system used in buildings today.

(deletion) Exception to IMC 606.2.2 (changed to IMC 606.2.3):

Exception needs to be deleted given the proposed new return air threshold will be increased from 2,000 cfm to 15,000 cfm.

(revision) IMC 606.2.3 (changed to IMC 606.2.4) editorial as a new section was inserted. Existing text unchanged.

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

PART II – IMC
Committee Action: **Disapproved**

Committee Reason: There was no compelling reason presented to move the smoke detector from the return air side to the supply air side of the fan. Fires in filters and fan motors are not as life threatening as fires in the occupied spaces which the return air detector would detect first. Some of the language does not coincide with NFPA 90A as claimed by the proponent.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Dave Frable, U.S. General Services Administration, requests Approval as Submitted for Part II.

Commenter's Reason: To say the least, the U.S. General Services Administration is disappointed with the reason statement provided by the 07/08 Fire Code Committee and Mechanical Code Committee for disapproval of this specific code change at the Code Development Hearings in Palm Springs, CA. The ICC Code Committees are the foundation upon which the process of development of the *ICC International Codes* is built and their importance cannot be overemphasized. In addition, it is essential that all ICC Code Committees prepare in advance, prior to their participation during the Code Development Hearings.
At the Code Development Hearings in Rochester, NY the Committee's reason statement for "Approval as Submitted" code change F113-06/07 Part I and Part II stated the following:

> **F113-06/07, Part I**
> **907.2.12.1 (IBC [F] 907.2.12.1)**
> **"Committee Reason:** Based on the proponent's reason statement. The proposal will provide correlation with the IMC and improve the level of protection against filter fires in air-handling systems. The threshold values will better correlate with the IMC and NFPA 90A as well as return them to the level of the legacy codes."
>
> **F113-06/07, Part II**
> **IMC 606.2 through 606.2.4**
> **"Committee Reason:** This proposed change will correlate with the requirements found in NFPA 90A, resulting in only requiring a smoke detector in the supply duct. Many jurisdictions use both NFPA 90A and the I-codes which causes contractors to have to install detectors in both the return and supply ducts. This will alleviate that problem. The proponent cited many examples where the detector failed to shut down the fans because the fire was in the filter and the detector was in the return. The committee also wanted to be consistent with the action taken by the Fire Code committee."

However, in the Code Development Hearings in Palm Springs, CA, the Fire Code Committee's reason statement in F170-07/08, it states that the main reason for disapproval was that "the committee felt that there is no justification for the change, especially since it was just changed to the current text in the last cycle" and that "some of the language does not coincide with NFPA 90A as claimed by the proponent" even though the Committee's reason statement in 06/07 for "approval as submitted" contradicts the Committee's reason statement for "disapproval" in 07/08.

Unfortunately, it appears the 07/08 Committee's did not meet their responsibilities as Committee members to prepare in advance prior to participating in the Code Development Hearings and has stated in accurate information in the Committee's reason statement. For example, the 07/08 Fire Code Committee states that one of their main reasons for disapproval was that the current text was change last cycle. This is an incorrect statement. The current code text has not been changed since the 2000 IFC. In addition, the Mechanical Code Committee states that one of their reasons is that the proposed revised code text does not correlate with NFPA 90A. This is also an inaccurate statement.

The overall intent of this code change is to improve the level of smoke detection within air-handling systems and to correlate the smoke detection requirements within the IFC, IMC, & NFPA 90A in a cost-effective manner. To improve the level of detection of smoke within air-handling systems, we have revised the location of detection from the return side to the supply side of the air handling systems. We believe fires on the supply air side of HVAC units due to fan belts, motors or combustible filters will be detected much quicker and fans will shut off appropriately. In addition, any smoke from a fire that travels in a return air duct will still be detected by the supply side duct smoke detector. A supply duct smoke detector could also pick up an exterior fire that gets pulled into the air handling system. Last but not least, we also believe that the current requirement for installing smoke detectors in return air systems exceeding 2,000 cfm is overly restrictive and seems to be completely opposite of what had been required by two of the three legacy codes (i.e., UBC and BOCA) and what is currently being required in NFPA 90A. In addition, correlating the IFC, IBC and IMC with NFPA 90A is also important as many jurisdictions adopt both the IFC/IMC and NFPA 90A. Accredited health care organizations are required by law to comply with NFPA 90A. Not having the subject requirements in the IBC in concert with NFPA 90A results in the unnecessary installation of smoke detectors in both the return and supply air systems. This code change proposal aims to maintain detection in air handling systems, not remove it. There should be no increase in installation costs as this code change proposal merely shifts the location of devices from the return air side to the supply air side, where air handling units are greater than 2000 cfm. In fact, changing the requirement as proposed will reduce the cost in jurisdictions that must comply with the IFC/IMC and NFPA 90A (i.e., leaving the requirements as currently stated in both the IFC and IMC already results in unnecessary additional costs).

Therefore based on these concerns, we urge the membership to approve this code change as submitted.

Final Action: AS AM AMPC____ D

F173-07/08
907.2.21 (IBC [F] 907.2.21)

Proposed Change as Submitted:

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

907.2.21 (IBC [F] 907.2.21) (Supp) Airport traffic control towers. An automatic fire detection system that activates the occupant notification system in accordance with Section 907.6 shall be provided in airport control towers in all occupiable and equipment spaces.

Exception: Audible appliances shall not be installed within the control tower cab.

Reason: Section 907 evolved as an amalgamation of the three legacy codes. Although Section 907 was revised during the last cycle some additional items have been identified that need clarification. The charging statement for Occupancy Groups is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. Nor is it consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

Bill Aaron (Code Consultants, Inc.),
Diane Arend (Office of the State Fire Marshal; California),
Gene Boecker (Code Consultants, Inc),
Shane Clary (Bay Alarm)
John Guhl (Office of the State Fire Marshal; California),
Tom Hammerberg (Automatic Fire Alarm Association, Inc),
Bill Hopple (SimplexGrinnell),
Dan Nichols (Building Codes Division; State of New York),
Jim Schifiliti (Fire Safety Consultants, Inc)

The proposed changes to 907.2.21 are to provide clarification as to where fire alarm devices and appliances are required within airport traffic control towers. Equipment spaces have been added as these may be areas within an airport traffic control tower where a fire may begin, but may not be occupied. Early warning of a fire in these areas is required so as to alert the occupants of occupancy and emergency forces.

Due to the nature of the operation of airport traffic control towers, the notification of occupants within the cab is to be by visual notification appliances only.

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

Committee Action: **Approved as Modified**

Modify the proposal as follows:

907.2.21 (IBC [F] 907.2.21) (Supp) Airport traffic control towers. An automatic ~~fire~~ smoke detection system that activates the occupant notification system in accordance with Section 907.6 shall be provided in airport control towers in all occupiable and equipment spaces.

Exception: Audible appliances shall not be installed within the control tower cab.

Committee Reason: The proposal was approved because the committee felt that it recognizes the critical need for quiet in air traffic control tower cabs. The modification provides correlation of the terminology in this section with the terminology established by code change F163-07/08.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Lori Lee Graham, City of Portland, OR, representing herself, requests Approval as Modified by this public comment.

Further modify proposal as follows:

907.2.21 (IBC [F] 907.2.21) (Supp) Airport traffic control towers. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.6 shall be provided in airport control towers in all occupiable and equipment spaces.

Exception: Audible appliances shall not be installed within the elevator cab serving a control tower ~~cab~~.

Commenter's Reason: The committee approved exception uses a term which is unclear regarding the intent of the application of the exception. Is it the elevator cab? Probably not because why would having an alarm sound in the elevator cab be a problem for the controllers doing their jobs. Cab appears to be a term used to mean the actual control room. A loud alarm in such rooms would likely conflict with other alarms set in the air traffic control system.

Final Action: AS AM AMPC____ D

F176-07/08
907.3.3.1, 907.3.3.1.1 (New)

Proposed Change as Submitted:

Proponent: Gene Boecker, Code Consultants, Inc.

1. Revise as follows:

907.3.3.1 (Supp) Group R-1 hotel and motel manual fire alarm system. A~~n automatic or~~ manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-1 hotels and motels more than three stories or with more than 20 sleeping units.

Exception: Buildings less than two stories in height where all sleeping units, attics and crawl spaces are separated by 1-hour fire-resistance-rated construction and each sleeping unit has direct access to a public way, exit court or yard.

2. Add new text as follows:

907.3.3.1.1 Group R-1 hotel and motel automatic fire alarm system. An automatic fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-1 hotels and motels throughout all interior corridors serving sleeping rooms not equipped with an approved, supervised sprinkler system installed in accordance with Section 903.

Exception: An automatic fire detection system is not required in buildings that do not have interior corridors serving sleeping units and where each sleeping unit has a means of egress door opening directly to an exit or to an exterior exit access that leads directly to an exit.

Reason: Section 907 evolved as an amalgamation of the three legacy codes. Although Section 907 was revised during the last cycle some additional items have been identified that need clarification. The charging statement for Occupancy Groups is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. Nor is it consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

Bill Aaron (Code Consultants, Inc.),
Diane Arend (Office of the State Fire Marshal; California),
Gene Boecker (Code Consultants, Inc),
Shane Clary (Bay Alarm)
John Guhl (Office of the State Fire Marshal; California),
Tom Hammerberg (Automatic Fire Alarm Association, Inc),
Bill Hopple (SimplexGrinnell),
Dan Nichols (Building Codes Division; State of New York),
Jim Schifiliti (Fire Safety Consultants, Inc)

This proposal is part of the effort to clean up the language for existing occupancies. The existing language requires an automatic or manual fire alarm system to be installed in existing R-1 hotel occupancies with no explanation of where the automatic fire alarm system would be required. By adding new language in 907.3.3.1.1, it clearly states where an automatic fire alarm system is required. The next exception allows an exception when existing R-1 hotel occupancies have a fire sprinkler system, since the legacy codes allowed the sprinkler exception. This was added to ensure the existing requirements are no more stringent than past new requirements.

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

Committee Action: **Approved as Modified**

Modify the proposal as follows:

907.3.3.1.1 Group R-1 hotel and motel automatic ~~fire alarm~~ smoke detection system. An automatic ~~fire alarm~~ smoke detection system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-1 hotels and motels throughout all interior corridors serving sleeping rooms not equipped with an approved, supervised sprinkler system installed in accordance with Section 903.

Exception: An automatic ~~fire~~ smoke detection system is not required in buildings that do not have interior corridors serving sleeping units and where each sleeping unit has a means of egress door opening directly to an exit or to an exterior exit access that leads directly to an exit.

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal was approved because the committee felt that it provides a needed improvement to the re-write effort begun in Section 907 in the last cycle by clearly indicating where an automatic smoke detection system is required in Group R-1 hotels and motels. The modification provides correlation of the terminology in this section with the terminology established by code change F163-07/08.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Gene Boecker, Code Consultants, Inc., representing himself, requests Approval as Modified by this public comment.

Further modify proposal as follows:

907.3.3.1 (Supp) Group R-1 hotel and motel manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-1 hotels and motels more than three stories or with more than 20 sleeping units.

Exceptions:

1. Buildings less than two stories in height where all sleeping units, attics and crawl spaces are separated by 1-hour fire-resistance-rated construction and each sleeping unit has direct access to a public way, exit court or yard.
2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:
   - 2.1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2;
   - 2.2. The notification appliances will activate upon sprinkler water flow; and
   - 2.3. At least one manual fire alarm box is installed at an approved location.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: During the committee hearings it was noted that while the intent of this code change was to include the exceptions for existing facilities in like manner to those already in the code for new construction, an exception did not make it through. The added text to 907.3.3.1 accomplished that task for smoke detection but one exception for the manual alarm device was not included in the prior code change. The exception noted above is taken verbatim from that in 907.2.8.1(supp) for new construction (Section 907.2.8.1 in the 2006 IBC).

The modification will harmonize the requirements for existing R-1 occupancies with that for new construction. Without this change it can be construed that the code is more restrictive on existing construction than on new construction. Clearly that is not the intent of the code. Therefore the language is needed for clarification.

Final Action: AS AM AMPC____ D

F178-07/08
907.3.4 through 907.3.4.3

Proposed Change as Submitted:

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

Revise as follows:

907.3.4 (Supp) Single- and multiple-station smoke alarms. Single- and multiple-station smoke alarms shall be installed in existing Group R occupancies and in dwellings not classified as Group R occupancies in accordance with Sections 907.3.4.1 through 907.3.4.3.

907.3.4.1 (Supp) Where required. Existing Group R occupancies and dwellings not classified as Group R occupancies not already provided with single-station smoke alarms shall be provided with single-station smoke alarms. Installation shall be in accordance with Section 907.2.10, except as provided in Sections 907.3.4.2 and 907.3.4.3.

907.3.4.2 (Supp) Interconnection. Where more than one smoke alarm is required to be installed within an individual dwelling unit or sleeping unit ~~in Group R-1, R-2, R-3 or R-4~~, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

Exceptions:

1. Interconnection is not required in buildings that are not undergoing alterations, repairs or construction of any kind.
2. Smoke alarms in existing areas are not required to be interconnected where alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for interconnection without the removal of interior finishes.

907.3.4.3 (Supp) Power source. ~~In Group R occupancies,~~ Single-station smoke alarms shall receive their primary power from the building wiring provided that such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery back-up shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exception: Smoke alarms are permitted to be solely battery operated: in existing buildings where no construction is taking place; in buildings that are not served from a commercial power source; and in existing areas of buildings undergoing alterations or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for building wiring without the removal of interior finishes.

Reason: The IPMC requires smoke alarms to be installed in R occupancies and dwellings not considered R occupancies. The IPMC reads as follows:

"704.2 Smoke alarms. Single or multiple-station smoke alarms shall be installed and maintained in Groups R-2, R-3, R-4 and in dwellings not regulated in Group R occupancies, regardless of occupant load at all of the following locations…"

The IPMC language has been simplified by stating that smoke alarms are required in "all residential occupancies".

Section 907.3.4 in the IFC covers smoke alarms in all other dwelling units and guest rooms. This revision will provide consistency with the requirements in IPMC Section 704.2.

The revisions in Sections 907.3.4.2 and 907.3.4.3 only remove the reference to R-1 through R-4. The inclusion of this terminology is unnecessary, since the charging statements in Sections 907.3.2 and 907.3.2.1 already specify that the subsections apply to "Group R occupancies and dwellings not classified as Group R". It is not necessary to restate the applicable occupancies in every section.

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

Committee Action: **Approved as Modified**

Modify the proposal as follows:

907.3.4 (Supp) Single- and multiple-station smoke alarms. Single- and multiple-station smoke alarms shall be installed in existing Group R occupancies and in dwellings ~~not classified as Group R occupancies~~ constructed in accordance with the *International Residential Code* in accordance with Sections 907.3.4.1 through 907.3.4.3.

907.3.4.1 (Supp) Where required. Existing Group R occupancies and dwellings ~~not classified as Group R occupancies~~ constructed in accordance with the *International Residential Code* not already provided with single-station smoke alarms shall be provided with single-station smoke alarms. Installation shall be in accordance with Section 907.2.10, except as provided in Sections 907.3.4.2 and 907.3.4.3.

(Portions of proposal not shown remain unchanged)

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change, which provides correlation with the IPMC in requiring single- and multiple-station smoke alarms in all dwelling units, whether considered in Group R or not. The committee felt that the modification clarifies that the dwellings intended to be regulated are those constructed in accordance with the IRC.

Assembly Action: **None**

Analysis: The original proposal included the language "…and in dwellings not classified as Group R occupancies", which was proposed based upon the *International Property Maintenance Code*. The modification recommended refers to the dwelling units constructed in accordance with the IRC for retroactive requirements for installation of smoke alarms, which has no application given that the IRC requires smoke alarms for all new dwelling units constructed in accordance with the IRC. Further, this modification imposes a retroactive requirement for the IRC that is outside the scope of the IFC. A public comment is recommended to resolve this issue.

Individual Consideration Agenda

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

Public Comment:

Steve Orlowski, National Association of Home Builders (NAHB), requests Approval as Submitted.

Commenter's Reason: As indicated in the report on public hearings, the modification proposed by the committee would have no application on dwellings constructed under the IRC. The IRC already requires dwelling units to be equipped with smoke alarms in accordance with NFPA 72. The proposed modification does not improve the IFC nor does it correlate with the requirements found in the IPMC as originally proposed by the proponent. Furthermore, the committee's modification to impose retroactive requirements on the IRC was analyzed by ICC staff and was determined to be outside the scope of the IFC.

Final Action: AS AM AMPC____ D

F180-07/08
907.5.3, 907.5.3.1 (New) [IBC [F] 907.5.3, [F] 907.5.3.1 (New)]

Proposed Change as Submitted:

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

907.5.3 (IBC [F] 907.5.3) (Supp) Automatic <u>smoke</u> detection. <u>An automatic smoke detection system shall utilize</u> ~~The automatic fire detectors shall be~~ smoke detectors<u>.</u> ~~Where~~ <u>unless</u> ambient conditions prohibit <u>such an</u> installation. ~~of smoke detectors,~~ <u>In spaces where smoke detectors are not utilized</u>, other approved automatic fire detection shall be ~~permitted~~ <u>required</u>. ~~Where an automatic sprinkler protection system installed in such areas in accordance with Section 903.3.1.1 or 903.3.1.2 is provided and connected to the building fire alarm system, automatic heat detection required by this section shall not be required.~~

<u>907.5.3.1 (IBC [F] 907.5.3.1)Automatic sprinkler system.</u> <u>In areas where ambient conditions prohibit the installation of smoke detectors, an automatic sprinkler system installed in such areas in accordance with Section 903.3.1.1 or 903.3.1.2 and connected to the fire alarm system shall be approved as automatic fire detection.</u>

<u>Exception:</u> <u>Heat detectors for elevator functions.</u>

Reason: Section 907 evolved as an amalgamation of the three legacy codes. Although Section 907 was revised during the last cycle some additional items have been identified that need clarification. The charging statement for Occupancy Groups is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. Nor is it consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

Bill Aaron (Code Consultants, Inc.),
Diane Arend (Office of the State Fire Marshal; California),
Gene Boecker (Code Consultants, Inc),
Shane Clary (Bay Alarm)
John Guhl (Office of the State Fire Marshal; California),
Tom Hammerberg (Automatic Fire Alarm Association, Inc),
Bill Hopple (SimplexGrinnell),
Dan Nichols (Building Codes Division; State of New York),
Jim Schifiliti (Fire Safety Consultants, Inc)

This is an attempt to clean up the language regarding automatic smoke detection. The purpose is to drive home that automatic smoke detection systems use smoke detectors unless they are not able to be installed because of the space being served. Also, it spins off the automatic sprinkler system tradeoff to make it an approved use in place of smoke detectors when the area cannot be served with smoke detectors and the system is connected to the fire alarm system. The exception listed as part of the proposed sprinkler system tradeoff section is so the code user does not utilize this section for the prescriptive elevator requirements in ASME A17.1 for the specialized fire safety functions regulated therein.

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

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that it does not provide the clarity desired by the proponent and would cause confusion in the application of the section.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Gene Boecker, Code Consultants, Inc., representing himself, requests Approval as Modified by this public comment.

Modify proposal as follows:

907.5.3 (IBC [F] 907.5.3) (Supp) Automatic smoke detection. Where an ~~An~~ automatic smoke detection system is required it shall utilize smoke detectors unless ambient conditions prohibit such an installation. In spaces where smoke detectors ~~are~~ cannot be utilized due to ambient conditions, ~~other~~ approved automatic ~~fire~~ heat detectors ~~detection~~ shall be ~~required~~ permitted.

907.5.3.1 (IBC [F] 907.5.3.1)Automatic sprinkler system. For conditions other than specific fire safety functions noted in Section 907.4, in ~~In~~ areas where ambient conditions prohibit the installation of smoke detectors, an automatic sprinkler system installed in such areas in accordance with Section 903.3.1.1 or 903.3.1.2 ~~and~~ that is connected to the fire alarm system shall be approved as automatic ~~fire~~ heat detection.

~~**Exception:** Heat detectors for elevator functions.~~

Commenter's Reason: The language intent in the original proposal is incorporated into the single section. Consistent with the other code changes this year, the distinction is made between smoke detection and "fire alarm." The application whereby heat detection is permitted is included but clarified so that sprinklers cannot be used as a substitution for specific heat detectors required in Section 907.4. This is consistent with current intent.

While there may yet be a need to clean up some of the interpretation applications it is important to get the "fire alarm' language out of the code since it is being deleted elsewhere and will no longer have relevance. This maintains the status quo in application while cleaning up the language for the 2009 edition.

Final Action: AS AM AMPC____ D

F186-07/08
909.6 (IBC [F] 909.6)

Proposed Change as Submitted:

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Revise as follows:

909.6 (IBC [F] 909.6) Pressurization method. ~~The primary mechanical means of controlling smoke shall be~~ Where approved by the fire code official, the means of controlling smoke shall be permitted to be by pressure differences across smoke barriers. Maintenance of a tenable environment is not required in the smoke control zone of fire origin.

Reason: This change allows systems described in 909.6, 909.7 and 909.8 to be chosen equally based on the occupancy of the building. Different systems are better for use in different use groups. This is necessary to allow 909.8 to be chosen for its tenable environment for security, safety for I-3 occupancies, which must use a 'defend in place' method of emergency response.

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

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that it is over-broad in its scope, that the current preferred method is preferable and that the proposal could lead to inconsistent enforcement.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

A. Brooks Ballard, Virginia Department of Corrections, requests Approval as Modified by this public comment.

Replace proposal with the following:

909.6 Pressurization method. The primary mechanical means of controlling smoke shall be by pressure differences across smoke barriers. Maintenance of a tenable environment is not required in the smoke control zone of fire origin.

> **Exception:** Control of smoke in Group I-3 occupancies shall have a tenable environment in the smoke control zone of fire origin or shall utilize the Exhaust method in Section 909.8.

Commenter's Reason: In Group I-3 occupants are not allowed to freely egress the area of fire origin. If there is a fire in I-3, it is frequently caused by a riot situation. Responsibility for the safety and welfare of the occupants of I-3 is the responsibility of staff at the facility and a tenable environment is needed to protect both the occupants and to allow staff to be able to take necessary actions to protect and remove occupants from the area.

Final Action: AS AM AMPC____ D

F187-07/08
909.8 (IBC [F] 909.8; IMC [F] 513.8)

Proposed Change as Submitted:

Proponent: Raymond A. Grill, PE, Arup, representing himself

Revise as follows:

909.8 (IBC [F] 909.8; IMC [F] 513.8) Exhaust method. When approved by the fire code official, mechanical smoke control for large enclosed volumes, such as in atriums or malls, shall be permitted to utilize the exhaust method. Smoke control systems using the exhaust method shall be designed in accordance with NFPA 92B. Balcony spill plume calculations are not required to determine smoke development.

Reason: During the 03/04 code development cycle, the requirement for a balcony spill plume calculation was removed from the IBC by Proposal F120-03/04.

The proposal is reproduced below. When the NFPA 92 was incorporated as a reference to replace the methodology in Section 909.8, no modifications were made to clarify the intent. The result is that NFPA 92B can be interpreted and has been interpreted to require a balcony spill plume calculation to determine smoke development regardless of the level of protection at balconies. This language is needed in the code to appropriately reflect the intent of the code.

> **FS120-03/04**
> **909.8.3 (IFC [B] 909.8.3)**
>
> Proponent: Gene Boecker, Code Consultants, Inc.
>
> **Delete without substitution:**
>
> ~~909.8.3 Balcony spill plumes. The plume mass flow rate (mp) for spill plumes shall be determined using the geometrically probable width based on architectural elements and projections in the following equation:~~
>
> ~~mp = 0.124(QW2)1/3(Zb + 0.25H) (Equation 9-5)~~
> ~~For SI: mp = 0.36(QW2)1/3(Zb + 0.25H)~~
> ~~where:~~
> ~~H = Height above fire to underside of balcony, feet (m).~~
> ~~mp = Plume mass flow rate, pounds per second (kg/s).~~
> ~~Q = Total heat output.~~
> ~~W = Plume width at point of spill, feet (m).~~
> ~~Zb = Height from balcony, feet (m).~~

The balcony spill plume equation should be removed from the Code due to lack of substantiation that the equation provides an accurate description of the smoke production of a balcony spill plume and due to the lack of a need for such an equation. Section 909 of the IBC was adapted from Section 905 of the 1997 Uniform Building Code (UBC). Section 905 of the UBC was a result of ICBO code change 57-95-1 (Item 213) in the 1991 code development cycle. Code change 57-95-1 (Item 213) was based on Design of Smoke Control Systems for Buildings published by ASHRAE, NFPA 92A Recommended Practice for Smoke Control Systems, and the draft publication of NFPA 92B,

Technical Guide for Smoke Control Systems in Malls, Atria and Large Areas. The equation in Section 909.8.3 of the IBC is from what is now Section 3.8.2.1 of NFPA 92B. NFPA 92B references the following papers by Law and by Morgan and Marshall as the basis for NFPA 92B Section 3.8.2.1: Law, M., "A Note on Smoke Plumes from Fires in Multi-level Shopping Malls," Fire Safety Journal, 10, 1986, pp. 197-202. Morgan, H.P., and Marshall, N.R., "Smoke Control Measures in Covered Two-Story Shopping Malls Having Balconies as Pedestrian Walkways," BRE CP 11/79, Borehamwood, 1979.

The paper by Law examines the data developed in the paper by Morgan and Marshall to determine the balcony spill plume equation. The data developed by Morgan and Marshall was for a 1/10 scale model of a two-story shopping mall. The experiments used an electric heater with a maximum heat output of 4 kW as the fire source. Data was collected for a single compartment size, balcony height, and mall ceiling height. Based on this very limited data, Law developed the balcony spill plume equation. The paper by Law even states in its conclusion on the balcony spill plume equation that, ". . . further analysis is needed to establish its validity."

While the validity of the balcony spill plume is questionable for the situation it was designed for, it is also often misapplied in applications that is was not designed for. The balcony spill plume equation was designed to calculate the amount of smoke produced from a fire in a shopping mall store, where the smoke spills into the mall and across a balcony. The models used to develop the balcony spill plume equation included a lintel between the store and the balcony. The equation is not applicable to situations where a lintel is not provided, since the lintel changes the momentum of the smoke traveling from the store into the mall. This is discussed in further detail, in, Klote, J.H., "An Overview of Atrium Smoke Management," Fire Protection Engineering, No. 7, 2000, pp. 24-34. The National Research Council of Canada with the support of the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) is currently conducting full scale experiments to determine the extent of the applicability of the balcony spill plume equation and to provide data for the development of new correlations describing the balcony spill plume. This study is intended to address the many questions that exist about the balcony spill plume equation used in NFPA 92B and the IBC.

In practice the balcony spill plume equation is of little use in an atrium, covered mall building, or arena, since these buildings are required to be protected throughout with an automatic sprinkler system. A fire under a balcony or in an adjacent store, which would be relatively close to the automatic sprinkler protection, is expected to be quickly controlled or extinguished by the automatic sprinkler protection. Based on the limited validity of the balcony spill plume equation, Equation 9-5 in the IBC, and the limited use of the equation given the Code's requirements for automatic sprinkler protection, Section 909.8.3 should be deleted.

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

Committee Action: Disapproved

Committee Reason: The proposal was disapproved because the committee noted that the method being proposed is one of three methods recognized in the current NFPA 92B and that committee is discussing deleting it. The committee felt that since it is already in the referenced standard NFPA 92 B, it need not be duplicated in the code text.

Assembly Action: None

Individual Consideration Agenda

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

Public Comment 1:

Gene Boecker, Code Consultants, Inc., representing himself, requests Approval as Submitted.

Commenter's Reason: "The code language supersedes the standard where specifically applicable" is the general rule throughout the codes. The committee's comment about duplicating it in the code is not applicable since the intent is to make sure that the balcony spill plume method, while noted in the standard is not appropriate for the IBC or IFC.

The balcony spill plume as included in the NFPA 92 is applicable to non-sprinkler controlled fires. Since the IBC and IFC only include smoke control for sprinklered buildings it is inconsistent with the code language to apply the balcony spill plume. There are scientific questions regarding its validity as noted in the original supporting statement where it was deleted from the code previously.

As the code is written currently, all the smoke developed concepts in the NFPA 92 standard are required to be considered when using the exhaust method. Since the balcony spill plume is not appropriate in sprinklered buildings the code should be clear that it is not an applicable design method.

Public Comment 2:

Ray Grill, PE, Arup, representing himself, requests Approval as Submitted.

Commenter's Reason: During the 03/04 code development cycle, the requirement for a balcony spill plume calculation was removed from the IBC by Proposal F120-03/04.

The proposal is reproduced below. When the NFPA 92 was incorporated as a reference to replace the methodology in Section 909.8, no modifications were made to clarify the intent. The result is that NFPA 92B can be interpreted and has been interpreted to require a balcony spill plume calculation to determine smoke development regardless of the level of protection at balconies. This language is needed in the code to appropriately reflect the intent of the code.

FS120-03/04
909.8.3 (IFC [B] 909.8.3)
Proponent: Gene Boecker, Code Consultants, Inc.
Delete without substitution:
~~909.8.3 Balcony spill plumes.~~ ~~The plume mass flow rate (mp) for spill plumes shall be determined using the geometrically probable width based on architectural elements and projections in the following equation:~~

~~mp = 0.124(QW2)1/3(Zb + 0.25H)~~ **~~(Equation 9-5)~~**
~~For SI: mp = 0.36(QW2)1/3(Zb + 0.25H)~~
~~where:~~
~~H = Height above fire to underside of balcony, feet (m).~~
~~mp = Plume mass flow rate, pounds per second (kg/s).~~
~~Q = Total heat output.~~
~~W = Plume width at point of spill, feet (m).~~
~~Zb = Height from balcony, feet (m).~~

The balcony spill plume equation should be removed from the Code due to lack of substantiation that the equation provides an accurate description of the smoke production of a balcony spill plume and due to the lack of a need for such an equation. Section 909 of the IBC was adapted from Section 905 of the 1997 Uniform Building Code (UBC). Section 905 of the UBC was a result of ICBO code change 57-95-1 (Item 213) in the 1991 code development cycle. Code change 57-95-1 (Item 213) was based on Design of Smoke Control Systems for Buildings published by ASHRAE, NFPA 92A Recommended Practice for Smoke Control Systems, and the draft publication of NFPA 92B, Technical Guide for Smoke Control Systems in Malls, Atria and Large Areas. The equation in Section 909.8.3 of the IBC is from what is now Section 3.8.2.1 of NFPA 92B. NFPA 92B references the following papers by Law and by Morgan and Marshall as the basis for NFPA 92B Section 3.8.2.1: Law, M., "A Note on Smoke Plumes from Fires in Multi-level Shopping Malls," Fire Safety Journal, 10, 1986, pp. 197-202. Morgan, H.P., and Marshall, N.R., "Smoke Control Measures in Covered Two-Story Shopping Malls Having Balconies as Pedestrian Walkways," BRE CP 11/79, Borehamwood, 1979.

The paper by Law examines the data developed in the paper by Morgan and Marshall to determine the balcony spill plume equation. The data developed by Morgan and Marshall was for a 1/10 scale model of a two-story shopping mall. The experiments used an electric heater with a maximum heat output of 4 kW as the fire source. Data was collected for a single compartment size, balcony height, and mall ceiling height. Based on this very limited data, Law developed the balcony spill plume equation. The paper by Law even states in its conclusion on the balcony spill plume equation that, ". . . further analysis is needed to establish its validity."

While the validity of the balcony spill plume is questionable for the situation it was designed for, it is also often misapplied in applications that is was not designed for. The balcony spill plume equation was designed to calculate the amount of smoke produced from a fire in a shopping mall store, where the smoke spills into the mall and across a balcony. The models used to develop the balcony spill plume equation included a lintel between the store and the balcony. The equation is not applicable to situations where a lintel is not provided, since the lintel changes the momentum of the smoke traveling from the store into the mall. This is discussed in further detail, in, Klote, J.H., "An Overview of Atrium Smoke Management," Fire Protection Engineering, No. 7, 2000, pp. 24-34. The National Research Council of Canada with the support of the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) is currently conducting full scale experiments to determine the extent of the applicability of the balcony spill plume equation and to provide data for the development of new correlations describing the balcony spill plume. This study is intended to address the many questions that exist about the balcony spill plume equation used in NFPA 92B and the IBC.

In practice the balcony spill plume equation is of little use in an atrium, covered mall building, or arena, since these buildings are required to be protected throughout with an automatic sprinkler system. A fire under a balcony or in an adjacent store, which would be relatively close to the automatic sprinkler protection, is expected to be quickly controlled or extinguished by the automatic sprinkler protection. Based on the limited validity of the balcony spill plume equation, Equation 9-5 in the IBC, and the limited use of the equation given the Code's requirements for automatic sprinkler protection, Section 909.8.3 should be deleted.

Final Action: AS AM AMPC____ D

F188-07/08

909.8.1 (IBC [F] 909.8.1)

Proposed Change as Submitted:

Proponent: Jeffrey S. Tubbs, PE, Arup, representing himself

Revise as follows:

909.8.1 (IBC [F] 909.8.1) (Supp) Smoke layer. The height of the lowest surface of the smoke layer interface shall be maintained at least 6 feet above any walking surface that forms a portion of a required egress system within the smoke layer. Where approved, methods to maintain a tenable environment as defined in NFPA 92B shall be permitted. Where methods to maintain a tenable environment are used, such environment shall be maintained within all exit accesses and area of refuge access paths for the time necessary to allow occupants to reach an exit or area of refuge. A peer review shall be required where methods to maintain a tenable environment are used.

Reason: NFPA 92B includes simple algebraic equations to calculate the exhaust required to maintain a smoke layer height to 6 feet above the highest walking surfaces, as well as advanced methods to allow smoke below 6 feet, when the environment is shown to be tenable. Computational Fluid Dynamics (CFD) techniques such as Fire Dynamics Simulator (developed by NIST) provide advanced methods for calculating concentrations of smoke and hot gases within egress and evacuation paths. CFD methods are better suited to simulate the movement of smoke and hot gases than simple algebraic equations, as these methods simulate the fundamental physics of smoke and hot gas movement through compartments. CFD methods have the added benefits of better simulating the compartment geometry, better simulating the affects of the placement and velocity of exhaust and make-up air locations, and providing visualizations of smoke flows. This can lead to more effective smoke management designs, and provide designers with a better understanding of the expected flows within the compartment. However, for many situations, the simple two-layer assumption inherent in the algebraic equations is not valid, rather the

smoke layer interface transitions from a higher concentration to a lower concentration. In these situations, CFD methods require tenability assessments to determine if smoke management goals are achieved. The current prescriptive code requirements are unclear as to whether or not methods to maintain a tenable environment are allowed. This code change intends to better align the IBC requirements with the NFPA 92B and clarify the appropriate use of tenability assessments for smoke management design.

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

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that the alternative design method proposed in this proposal could simply be handled through the provisions of Section 104.9 and that it need not be enumerated in the code text.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Gene Boecker, Code Consultants, Inc., representing himself, requests Approval as Submitted.

Commenter's Reason: The committee's reason for disapproval was that there are already allowances for using alternative methods in Chapter One (specifically 104.9) and that it not have acceptable alternative enumerated in the code. With due respect to the committee, that practice is already done. Particularly in Chapter 7 of the IBC there are numerous acceptable alternative methods identified throughout Section 720. Section 721 sets out the alternative methods from the use of ASTM E119 to determine fire resistance ratings. Further Section 703.3 specifically identifies alternative methods for calculating fire resistance. The precedence is already within the code.

More critically, it is important to add the language into the code for two other reasons: First, the code should recognize the applicable methodologies when those methodologies have been tested and found appropriate. Without such guidance the code official is without an understanding of what may and what may not be acceptable. Because NFPA 92B has been used widely and is widely recognized, it should be identified as one of the applicable methodologies.

Second, many jurisdictions have enabling legislation of overarching laws that prohibit alternative without legal appeals through the court system. Chapter One becomes a complex system through which they cannot navigate without also navigating the legal system. If the alternatives are identified within the code text they are noted specifically as acceptable and the legal hopes can be avoided. It makes the code more user friendly for both the designer and the enforcing agency.

Final Action: AS AM AMPC____ D

F193-07/08
910.2 (IBC [F] 910.2)

Proposed Change as Submitted:

Proponent: Rick Thornberry, PE, The Code Consortium, representing AAMA Smoke Vent Task Group

Revise as follows:

910.2 (IBC [F] 910.2) Where required. Smoke and heat vents shall be installed in the roofs and draft curtains shall be installed on the underside of roofs of one-story buildings or portions thereof occupied for the uses set forth in Sections 910.2.1 through 910.2.3.

Reason: This is an editorial clarification to provide for a charging requirement that draft curtains are required to be installed under the provisions of this section as are smoke and heat vents.

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

Committee Action: **Disapproved**

Committee Reason: The committee felt that the proposal could create confusion in that it appears to require draft curtain in all cases whereas Chapter 23 allows certain exceptions. It was also felt that that the subject matter should be located in Section 910.3.5.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Rick Thornberry, The Code Consortium, Inc., representing AAMA Smoke Vent Task Group, requests Approval as Modified by this public comment.

Replace proposal as follows:

910.3.5 (IBC [F] 910.3.5) Draft curtains. Where required by Table 910.3, draft curtains shall be ~~provided~~ installed on the underside of the roof in accordance with this section.

Exception: Where areas of buildings are equipped with ESFR sprinklers, draft curtains shall not be provided within these areas. Draft curtains shall only be provided at the separation between the ESFR sprinklers and the conventional sprinklers.

Commenter's Reason: Based on the Committee's suggestion made in its Reason for disapproval of the original code change proposal, we are submitting this Public Comment. Instead of revising Section 910.2, we are proposing to revise Section 910.3.5 Draft Curtains as indicated in the Committee's Reason statement. This is an editorial clarification which indicates that the draft curtains are to be installed on the underside of the roof. Although this may be obvious, there is no definition for draft curtain, nor any other indication that draft curtains are to be installed on the underside of roofs. However, it is a basic assumption made by designers and installers who provides draft curtains in conjunction with smoke and heat vents.

Final Action: AS AM AMPC____ D

F194-07/08
Table 910.3 (IBC [F] Table 910.3)

Proposed Change as Submitted:

Proponent: Rick Thornberry, PE, The Code Consortium, representing AAMA Smoke Vent Task Group

Revise table footnote as follows:

TABLE 910.3 (IBC TABLE [F] 910.3)
REQUIREMENTS FOR DRAFT CURTAINS AND SMOKE AND HEAT VENTS[a]

(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m^2.

a. ~~Requirements for rack storage heights in excess of those indicated shall be in accordance with Chapter 23.~~ For solid-piled storage heights in excess of those indicated, an approved engineered design shall be used.
b. The distance specified is the maximum distance from any vent in a particular draft curtained area to walls or draft curtains which form the perimeter of the draft curtained area.
c. Where draft curtains are not required, the vent area to floor area ratio shall be calculated based on a minimum draft curtain depth of 6 feet (Option 1).
d. "H" is the height of the vent, in feet, above the floor.

Reason: Chapter 23 does not contain specific requirements for smoke and heat vents. It refers to Section 910.

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

Committee Action: **Disapproved**

Committee Reason: The committee felt that Note a serves valuable function in directing the code user to Chapter 23, notable Section 2308.5, and should be retained

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Rick Thornberry, The Code Consortium, Inc., representing AAMA Smoke Vent Task Group, requests Approval as Modified by this public comment.

Replace proposal as follows:

TABLE 910.3 (IBC TABLE [F] 910.3)
REQUIREMENTS FOR DRAFT CURTAINS AND SMOKE AND HEAT VENTS[a]

(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2

a. Additional requirements for rack storage heights in excess of those indicated shall be in accordance with Chapter 23. For solid-piled storage heights in excess of those indicated, an approved engineered design shall be used.
b. The distance specified is the maximum distance from any vent in a particular draft curtained area to walls or draft curtains which form the perimeter of the draft curtained area.
c. Where draft curtains are not required, the vent area to floor area ratio shall be calculated based on a minimum draft curtain depth of 6 feet (Option 1).
d. "H" is the height of the vent, in feet, above the floor.

Commenter's Reason: We agree with the Committee's concerns expressed in their Reason for disapproving this code change that the reference to Chapter 23 for rack storage heights in excess of those indicated in the table as noted in Footnote a serves a valuable function. However, the purpose for us deleting the reference was that there were no specific requirements that addressed smoke and heat vents and/or draft curtains. Therefore, we felt that it was an unnecessary reference within the context of the Table and Section 910. To remedy this and to clarify the code reference, we have proposed this Public Comment which slightly revises Footnote a to indicate that Chapter 23 should be referred to for "additional" requirements for those rack storage heights in excess of those indicated in the table. This will alert the user of the code to the fact that there are other requirements that should be considered in addition to those for the smoke and heat vents specified in Table 910.3 for these very rack storage facilities. Yet they will not need to refer to Chapter 23 for any additional criteria for smoke and heat vents or draft curtains.

Final Action: AS AM AMPC____ D

F197-07/08

910.3.2.2.1 (New) [IBC [F] 910.3.2.2.1 (New)]

Proposed Change as Submitted:

Proponent: Rick Thornberry, PE, The Code Consortium, representing AAMA Smoke Vent Task Group

Add new text as follows:

910.3.2.2.1 (IBC[F] 910.3.2.2.1) Ganged operation alternative. Where approved, all smoke and heat vents located within an automatic sprinkler system zone shall be designed to open simultaneously upon activation of the water flow detection alarm device provided for the automatic sprinkler system zone. The smoke and heat vents shall also be designed to operate in accordance with Section 910.3.2.3. Where the building contains only one automatic sprinkler system, the building shall be considered to be a single automatic sprinkler system zone. Where the building contains more than one automatic sprinkler system, each system shall be designated as a separate automatic sprinkler system zone within the building. Draft curtains complying with Section 910.3.5 shall be provided to separate each automatic sprinkler system zone in the building. Any other draft curtains required by Section 910.3.5 shall be allowed to be omitted. Electrical wiring for the operation and control of the smoke and heat vents shall comply with Section 910.4.4 or the wiring shall be installed in steel conduit. Where the automatic sprinkler system water flow detection alarm device is supplied with emergency or standby power, the activation system for the simultaneous operation of the smoke and heat vents shall also be supplied in the same manner. A manual override switch for use by the fire department for simultaneously activating all of the smoke and heat vents within each automatic sprinkler system zone shall also be provided for each zone in an approved location.

Reason: This code change provides for a new design alternative for sprinklered buildings using smoke and heat vents in what is called a ganged operation. This technology comes from Europe where it has been used successfully for many years. The AAMA Smoke Vent Task Group has also commissioned Hughes & Associates to conduct computer modeling studies to validate the performance of ganged operation of smoke and heat vents as prescribed in this new code section. We believe this alternate method is superior to the individual operation of smoke and heat vents, especially in sprinklered facilities.

The provisions we believe provide for a reliable operation of the gang system of smoke and heat vents and parallels the requirement for the protection of electrical wiring to that required for when mechanical smoke removal was used in lieu of smoke and heat vents. The operation of this system is triggered by the operation of the automatic sprinkler system water flow switch so that the smoke and heat vents will not open until after the sprinkler system has operated. Furthermore, the smoke and heat vents are also required to be able to be individually operated by thermally activated links as they would be under the traditional design approach. We consider this to be a fail safe approach so that should the sprinkler system not operate and trigger the water flow switch, then the smoke and heat vents will still be there to operate individually as they are triggered by heat from the growing fire.

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

Committee Action: **Disapproved**

Committee Reason: The committee felt that the proposal is unsubstantiated and unneeded and that it could be treated as an alternative method under the provisions of Section 104.9. Concern was expressed about the unwanted operation of the vents due to pressure surge-generated water flow switch activations, and especially about the potential for building and contents damage from the unwanted opening of the vents in inclement weather. It was also felt that the fire service should have the ability to keep the vents closed as needed to let the sprinklers do their job in fire control or extinguishment and to easily re-close the vents once they have been opened. It was unclear as to why the wiring enclosure is limited to steel conduit only when there are many reliable wiring methods available. It was also noted that, from an editorial standpoint, there is simply too much information contained in the one large proposed paragraph, which is inconsistent with code style.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Richard Schulte, Evanston, IL, representing himself, requests Disapproval.

Commenter's Reason: The supporting statement for this proposal indicates that the basis for this code change is a study conducted by Hughes Associates, Inc. (HAI) (dated February 18, 2008) which purports to demonstrate using the Fire Dynamics Simulator (FDS) model that the "ganged" operation of roof vents will not have an adverse effect on the capability of a sprinkler system to control a fire. The HAI study of the concept of "ganged" roof vent operation is incomplete and the use of the FDS model to predict the activation times of sprinklers has not been validated. The following is a list of the deficiencies and errors in the HAI study:

1. The study only utilizes one type of sprinkler which operates at only a single pressure for purposes of making a sweeping conclusion on the effect of the "ganged" operation of roof vents on sprinkler system activation. Other variables will affect the activation time of sprinklers, including sprinkler orifice size, sprinkler operating pressure, sprinkler temperature rating, sprinkler deflector design, sprinkler orientation (upright or pendent), sprinkler location with respect to the ceiling, ceiling height, ceiling construction and fire size. (These variables affect whether or not water droplets are deposited on the operating element of sprinklers which have not yet activated.) None of the variable listed were addressed in the HAI study. Hence, the HAI study should be considered to be incomplete.
2. The study utilizes the FDS (Version 4) model to predict sprinkler activation times. The issue of validation for predicting sprinkler operation times is addressed in Volume 7 of "Verification and Validation of Selected Fire Models for Nuclear Plant Applications" published by the US Nuclear Regulatory Commission (NRC) in May 2007. Page 3-2 in the NRC report specifically indicates that the FDS model has not been Verified and Validated for this purpose. The HAI study discusses the issue of validation only briefly and concludes that the use of the FDS is validated for this purpose. The HAI study conclusion that the use of the FDS is validated by the study is at odds with the NRC's conclusion. It is Schulte & Associates' opinion that the NRC's statement regarding validation for the purpose of predicting sprinkler activation times is correct and that HAI's conclusion is in error.
3. The HAI study did not include any large-scale experiments to verify the predictions obtained from the use of the FDS. Large-scale experiments (tests) are an essential part of validating the predictions of the FDS. NIST conducted a number of large-scale experiments (tests) to verify that the predictions of the FDS in NIST's investigations of the World Trade Center collapse, The Station Nightclub and the NIST portion of the Witt investigation into the fire at the Cook Country Administration Building in Chicago were accurate. Instead of doing experiments to confirm their results, HAI relied on test data from the 1997/1998 research sponsored by the National Fire Protection Research Foundation, but ignored the results of the large-scale tests, P-1 through P-5, in that research.
4. All of the FDS model runs in the HAI study, with the exception of run #10, predict that the first four operating sprinklers will activate within 5 second of the first sprinkler activation. In none of the 5 large-scale tests (Tests P-1 through P-5) in the NFPRF-sponsored research does this occur. In Test P-1, 227 seconds elapse between the activation of the first sprinkler and the activation of the fourth sprinkler. In Test P-2, 21 seconds elapse between the activation of the first sprinkler and the activation of the fourth sprinkler. In Test P-3, 56 seconds elapse between the activation of the first sprinkler and the activation of the fourth sprinkler. In Test P-4, 106 seconds elapse between the activation of the first sprinkler and the activation of the fourth sprinkler. In Test P-5, 73 seconds elapse between the activation of the first sprinkler and the fourth sprinkler. This is an indication that the FDS model is not capable of accurately predicting sprinkler activation of multiple sprinklers. It is likely that the reason for this is that the FDS is not capable of accurately addressing the phenomena where water droplets are deposited on the sprinkler activating mechanism from either adjacent sprinklers or from the fire plume.

Based upon the above, HAI's study of the "ganged" roof vent concept should be considered to be incomplete. It is Schulte & Associates' opinion that the conclusion reached by HAI based upon their study is incorrect. Common sense and logic indicates that the "ganged" operation of roof vents within 60 seconds of the activation of the sprinkler system water flow device will have a significant impact on the activation times of standard spray sprinklers. Given this, this code change or any modification of this proposal should be disapproved until such time as a complete research study of this proposal is conducted.

Final Action: AS AM AMPC____ D

F198-07/08
910.3.4 (IBC [F] 910.3.4)

Proposed Change as Submitted:

Proponent: Rick Thornberry, PE, The Code Consortium, representing AAMA Smoke Vent Task Group

Revise as follows:

910.3.4 (IBC [F] 910.3.4) (Supp) Vent locations. Smoke and heat vents shall be located 20 feet (6096 mm) or more from adjacent lot lines and fire walls and 10 feet (3048 mm) or more from fire barriers. Vents shall be uniformly located within the roof area ~~above high-piled storage areas,~~ with consideration given to roof pitch, draft curtain location, sprinkler location and structural members.

Reason: Editorial clarification. This requirement should apply in all cases, not just for high piled storage areas.

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

Committee Action: **Disapproved**

Committee Reason: The committee felt that the proposal could lead to vents being required throughout all roof areas, even where they would serve no useful purpose.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Rick Thornberry, The Code Consortium, Inc., representing AAMA Smoke Vent Task Group, requests Approval as Modified by this public comment.

Modify proposal as follows:

910.3.4 (IBC [F] 910.3.4) (Supp) Vent locations. Smoke and heat vents shall be located 20 feet (6096 mm) or more from adjacent lot lines and fire walls and 10 feet (3048 mm) or more from fire barriers. Vents shall be uniformly located within the roof <u>in the</u> area<u>s of the building where the vents are required to be installed by Section 910.2</u> with consideration given to roof pitch, draft curtain location, sprinkler location and structural members.

Commenter's Reason: This Public Comment responds to the Committee's Reason for disapproving the original code change proposal. The Committee was concerned that the original revisions to this section would have caused vents to be required throughout all roof areas in the building, even in areas where they would serve no useful purpose or were not otherwise required. So we have revised the code change proposal so that it clearly indicates that the vents are only to be installed in those areas of the building where the vents are required by Section 910.2. The important point of this revision is that the vents must be uniformly located within the roof in those areas where vents are to be provided and not just where they are located above high-piled storage areas.

Final Action: AS AM AMPC____ D

F199-07/08
910.3.5 (IBC [F] 910.3.5)

Proposed Change as Submitted:

Proponent: Edwin M. Berkel, CFI, Mehlville Fire Protection District, representing himself

Revise as follows:

910.3.5 (IBC [F] 910.3.5) Draft curtains. Where required, draft curtains shall be provided in accordance with this section.

Exception: Where areas of buildings are equipped with ESFR sprinklers, draft curtains shall not be provided within these areas. Draft curtains shall only be provided at the separation between the ESFR sprinklers and the ~~conventional~~ standard response sprinklers

Reason: The existing code text makes use of an undefined term, "conventional sprinklers". This code change corrects that by using "standard response sprinklers" which is the correct term utilized in the reference standards.

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

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change, which provides clarification by using correct sprinkler terminology in the correct manner.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Bob Eugene, Underwriters Laboratories, Inc., requests Approval as Modified by this public comment.

Modify proposal as follows:

910.3.5 (IBC [F] 910.3.5) Draft curtains. Where required, draft curtains shall be provided in accordance with this section.

Exception: Where areas of buildings are equipped with ESFR sprinklers, draft curtains shall not be provided within these areas. Draft curtains shall only be provided at the separation between the ESFR sprinklers and the ~~standard response~~ non-ESFR sprinklers.

Commenter's Reason: The approved code text uses "standard response sprinklers" which is the correct term utilized in the reference standards, but might limit some of the sprinkler response technology. The intent is to limit the early response of sprinklers using different response technology and this change will provide an unlimited array of sprinklers that maybe found in High-piled storage arrangement.

Final Action: AS AM AMPC____ D

F200-07/08
910 (IBC [F] 910)

Proposed Change as Submitted:

Proponent: Richard Schulte, Schulte & Associates

Revise section as follows:

SECTION 910
SMOKE ~~AND HEAT VENTS~~ REMOVAL SYSTEMS

910.1 (IBC [F] 910.1) General. Where required by this code or otherwise installed, smoke ~~and heat vents, or mechanical smoke exhaust systems, and draft curtains~~ removal systems shall conform to the requirements of this section.

Exceptions:

1. Frozen food warehouses used solely for storage of Class I and II commodities where protected by an approved automatic sprinkler system.
2. Where areas of buildings are equipped with early suppression fast-response (ESFR) sprinklers, ~~automatic~~ smoke and heat ~~vents~~ removal systems shall not be required within these areas.

910.2 (IBC [F] 910.2) Where required. Smoke ~~and heat vents~~ removal systems shall be ~~installed in roofs of~~ provided for one-story buildings or portions thereof occupied for the uses set forth in Sections 910.2.1 through 910.2.3.

910.2.1 (IBC [F] 910.2.1) Group F-1 or S-1. (No change to current text)

910.2.2 (IBC [F] 910.2.2) High-piled combustible storage. (No change to current text)

910.2.3 (IBC [F] 910.2.3) Exit access travel distance increase. (No change to current text)

910.3 (IBC [F] 910.3) Smoke removal systems. Smoke removal systems shall be of a type described in Section 910.3.1 or 910.3.2.

910.3.1 (IBC [F] 910.3.1) Sprinklered buildings. Smoke removal systems in buildings protected by a sprinkler system shall be permitted to be any one of the following types of systems, or a combination thereof:

1. Automatic smoke and heat vents
2. Manually-operated smoke and heat vents
3. Manually-activated mechanical smoke exhaust system
4. Manually openable louvers in the exterior walls
5. Manually openable doors and windows in the exterior walls.

910.3.2 (IBC [F] 910.3.2) Nonsprinklered buildings. Smoke removal systems in nonsprinklered buildings shall be automatic smoke and heat vents.

~~**910.3 (IBC [F] 910.3)**~~ **910.4 (IBC [F] 910.4)** ~~**Design and installation**~~ **Automatic and manually-operated smoke and heat vents.** The design and installation of automatic smoke and heat vents and draft curtains shall be as specified in Sections ~~910.3.1~~ 910.4.1 through ~~910.3.5.2~~ 910.4.5 and Table ~~910.3~~ 910.4. The design of manually-operated smoke and heat vents shall be as specified in Sections 910.4.1, 910.4.3 and 910.4.4 and Table 910.4.

~~**910.3.1 (IBC [F] 910.3.1)**~~ **910.4.1 (IBC [F] 910.4.1) Design.** Automatic and manually-operated smoke and heat vents shall be listed and labeled to indicate compliance with UL 793.

~~**910.3.2 (IBC [F] 910.3.2)**~~ **910.4.2 (IBC [F] 910.4.2) Automatic vent operation.** Automatic smoke and heat vents shall be capable of being operated by ~~approved~~ automatic and manual means. Automatic operation of smoke and heat vents shall conform to the provisions of Section ~~910.3.2.1~~ 910.4.2.1 through ~~910.3.2.3~~ 910.4.2.3.

~~**910.3.2.1 (IBC [F] 910.3.2.1)**~~ **910.4.2.1 (IBC [F] 910.4.2.1) Gravity-operated drop-out vents.** Automatic smoke and heat vents containing heat-sensitive glazing designed to shrink and drop out of the vent opening when exposed to fire shall fully open within 5 minutes after the vent cavity is exposed to a simulated fire, represented by a time-temperature gradient that reaches an air temperature of 500°F (260°C) within 5 minutes.

~~**910.3.2.2 (IBC [F] 910.3.2.2)**~~ **910.4.2.2 (IBC [F] 910.4.2.2) Sprinklered buildings.** Where installed in buildings provided with an approved automatic sprinkler system, smoke and heat vents shall be designed to operate automatically by activation of a heat-sensing device with a temperature rating equal to or above the temperature rating of the sprinklers.

~~**910.3.2.3(IBC [F] 910.3.2.3)**~~ **910.4.2.3 (IBC [F] 910.4.2.3) Nonsprinklered buildings.** Where installed in buildings not provided with an approved automatic sprinkler system, smoke and heat vents shall be automatically operated by actuation of a heat-sensing device rated at between 100°F (38°C) and 220°F (104°C) above ambient.

~~**910.3.3 (IBC [F] 910.3.3)**~~ **910.4.3 (IBC [F] 910.4.3) Vent dimensions.** The effective venting area shall not be less than 16 square feet (1.5 m^2) with no dimension less than 4 feet (1219 mm), excluding ribs or gutters having a total width not exceeding 6 inches (152 mm).

~~**910.3.4 (IBC [F] 910.3.4)**~~ **(Supp) 910.4.4 (IBC [F] 910.4.4) Vent locations.** Automatic smoke and heat vents shall be located 20 feet (6096 mm) or more from adjacent lot lines and fire walls and 10 feet (3048 mm) or more from fire barriers. Automatic and manually-operated vents shall be uniformly located within the roof area above high-piled storage areas, with consideration given to roof pitch, draft curtain location, sprinkler location and structural members.

~~**910.3.5 (IBC [F] 910.3.5)**~~ **910.4.5 (IBC [F] 910.4.5) Draft curtains.** Where required by Table 910.3, draft curtains shall be provided in accordance with this section.

Exception: Where areas of buildings are equipped with ESFR sprinklers, draft curtains shall not be provided within these areas. Draft curtains shall only be provided at the separation between the ESFR sprinklers and the conventional sprinklers.

~~**910.3.5.1 (IBC [F] 910.3.5.1)**~~ **910.4.5.1 (IBC [F] 910.4.5.1) Construction.** Draft curtains shall be constructed of sheet metal, lath and plaster, gypsum board or other approved materials which provide equivalent performance to resist the passage of smoke. Joints and connections shall be smoke tight.

~~**910.3.5.2 (IBC [F] 910.3.5.2)**~~ **910.4.5.2 (IBC [F] 910.4.5.2) Location and depth.** The location and minimum depth of draft curtains shall be in accordance with Table 910.3.

~~**910.4 (IBC [F] 910.4)**~~ **910.5 (IBC [F] 910.5) Manually-activated mechanical smoke exhaust system.** ~~Where approved by the fire code official, engineered mechanical smoke exhaust shall be an acceptable alternate to smoke and heat vents.~~ The design and installation of a mechanical smoke exhaust system shall be as specified in Sections 910.5.1 through 910.5.6.

~~**910.4.1 (IBC [F] 910.4.1)**~~ **910.5.1 (IBC [F] 910.5.1) Location.** Exhaust fans shall be uniformly spaced ~~within each draft-curtained area~~ within the floor area served by the exhaust system and the maximum distance between fans shall not be greater than ~~100~~ 200 feet (~~30280~~ 60560 mm).

~~**910.4.2 (IBC [F] 910.4.2)**~~ **910.5.2 (IBC [F] 910.5.2) Size.** Fans shall have a maximum individual capacity of 30,000 cfm (14.2 m^3/s). The aggregate capacity of smoke exhaust fans shall be determined by the following equation:

$$C = A \times \text{~~300~~ } 100$$

where:

C = Capacity of mechanical ventilation required, in cubic feet per minute (m^3/s).
A = Area of roof vents provided in square feet (m^2) in accordance with Table 910.3.

~~**910.4.3 (IBC [F] 910.4.3)**~~ **910.5.3 (IBC [F] 910.5.3) Operation.** Mechanical smoke exhaust fans shall be ~~automatically~~ activated by ~~the automatic sprinkler system or by heat detectors having operating characteristics equivalent to those described 901.3.2~~ manual controls only. Individual manual controls for each fan shall also be provided. Automatic activation of the mechanical smoke exhaust system shall not be permitted.

~~**910.4.4 (IBC [F] 910.4.4)**~~ **(Supp) 910.5.4 (IBC [F] 910.5.4) Wiring and control.** Wiring for operation and control of smoke exhaust fans shall be connected ahead of the main disconnect and protected against exposure to temperatures in excess of 1,000°F (538°F) for a period of not less than ~~15~~ 5 minutes. Controls shall be located so as to be immediately accessible to the fire service from the exterior of the building and protected against interior fire exposure by not less than 1-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.

~~**910.4.5 (IBC [F] 910.4.5)**~~ **910.5.5 (IBC [F] 910.5.5) Supply air.** Supply air for exhaust fans shall be provided at or near the floor level and shall be sized to provide a minimum of 50 percent of the required exhaust. Openings for supply air shall be uniformly distributed around the periphery of the area served.

~~**910.4.6 (IBC [F] 910.4.6)**~~ **910.5.6 (IBC [F] 910.5.6) Interlocks.** In combination comfort air-handling/smoke removal systems or independent comfort air-handling systems, fans shall be controlled to shut down in accordance with the approved smoke control sequence.

910.6 (IBC [F] 910.6) Manually openable louvers in the exterior walls. Manually openable louvers in the exterior walls shall provide 100 square feet of clear opening for each 100 feet (30.5 m) of building perimeter.

910.6.1 (IBC [F] 910.6.1) Spacing. The spacing between louvers shall not exceed 200 feet (61 m).

910.7 (IBC [F] 910.7) Manually openable doors and windows in the exterior walls. Manually openable doors and windows in the exterior walls shall provide 100 square feet of opening for each 100 feet of building perimeter.

910.7.1 (IBC [F] 910.7.1) Spacing. The spacing between doors and windows shall not exceed 200 feet (61 m).

TABLE 910.3 (IBC [F] TABLE 910.3)
REQUIREMENTS FOR DRAFT CURTAINS AND SMOKE AND HEAT VENTS[a,b]

OCCUPANCY GROUP AND COMMODITY CLASSIFICATION	DESIGNATED STORAGE HEIGHT (feet)	MINIMUM DRAFT CURTAIN DEPTH (feet)	MAXIMUM AREA FORMED BY DRAFT CURTAINS (square feet)	VENT-AREA-T0 FLOOR-AREA RATIO[c]	MAXIMUM SPACING OF VENT CENTERS (feet)	MAXIMUM DISTANCETO VENTS FROM WALL OR DRAFT CURTAIN[b c] (feet)
Group F-1 and S-1	___	0.2 x H[d e] but ≥ 4	50,000	1:100	120	60

a. (No change to existing text)
b. Draft curtains are not required where manually-operated smoke and heat vents are provided.
~~b~~ c. (No change to existing text)
~~c~~ d. (No change to existing text)
~~d~~ e. (No change to existing text)

(Portions of table and footnotes not shown remain unchanged)

Reason: The purpose of this code change proposal is two-fold. First, this proposal incorporates the results of fire testing on the interaction of standard spray sprinklers and automatic smoke and heat (roof) vents conducted at Underwriters Laboratories (UL) in 1997 and 1998 into the provisions of this code section. Second, this proposal reflects changes in fire fighting operations recommended by the National Institute of Occupational Safety and Health (NIOSH) and also by FEMA Firefighter Life Safety Summit (held on April 14, 2004).

Special provisions which addressed the hazard of high-piled storage originated in the Uniform Building Code (UBC) and Uniform Fire Code (UFC). The requirements for high-piled storage contained in the 1979 edition of the UFC required that a manually-activated mechanical smoke removal system be provided in sprinklered buildings which contained high-piled storage. Further, the high-piled storage provisions contained in the 1979 UFC specifically prohibited the installation of smoke and heat vents in sprinklered buildings (due to concerns that the opening of automatic smoke and heat vents could adversely impact the operation of sprinklers and could cause the failure of the sprinkler system).

In the early 1980's, a UFC ad hoc committee on high-piled storage was formed. (The proponent of this proposal represented the Northern California Fire Prevention Officers (NCFPO) on the ad hoc committee until August, 1982.) This ad hoc committee recommended that the high-piled storage provisions contained in the UFC be modified to reverse the code provisions which prohibited the use of smoke and heat (roof) vents in sprinklered buildings and proposed that automatic smoke and heat vents be specifically required in sprinklered buildings containing high-piled storage.

The UFC ad hoc committee recommended that automatic smoke and heat vents be provided in sprinklered buildings for two basic reasons (and only two reasons). The first reason was to assist interior manual fire fighting operations and the second reason was to reduce property damage caused by smoke and heat. In effect, the committee decision to require roof vents in sprinklered buildings brushed aside the concern that the opening of roof vents could adversely affect the operation of the sprinkler system, however, the one issue that the ad hoc committee most certainly did not address (because it was not known at the time) was whether or not the operation of the sprinkler system would have an adverse impact on the opening of roof vents.

In the early 1990's, fire testing by Factory Mutual Research Corporation (FMRC) determined that draft curtains required to be utilized with smoke and heat vents could adversely affect the number and location of sprinklers which operated in a fire (depending upon where the fire was located with respect to the draft curtains). Based upon this finding, the requirements for draft curtains contained in the Uniform Fire Code were modified and, in most cases, the requirement for draft curtains were removed, when the International Fire Code was developed. (Since automatic roof vents and draft curtains are a "team", the removal of the requirement for draft curtains has a detrimental effect on the operation of roof vents.)

In 1997 and 1998, the National Fire Protection Research Foundation (NFPRF) sponsored testing on the interaction of sprinklers and smoke and heat vents at Underwriters Laboratories in an attempt to finally resolve the issue of whether or not open smoke and heat vents adversely affected the operation of sprinklers. While the NFPRF testing did not conclusively resolve this issue, the NFPRF tests supported FMRC's conclusion that draft curtains could negatively impact the operation of sprinklers and also determined that the operation of standard spray sprinklers negatively impacted the operation of roof vents. In fact, the NFPRF tests determined that automatic roof vents are unlikely to automatically open in buildings where the sprinkler system successfully or marginally controls a fire.

Excerpts from the report on the NFPRF tests (NISTIR 6196-1) addressing the impact of operating sprinklers on the opening of automatic roof vents include the following:

"*It had become clear by this time in the project that the vents were unlikely to open when the fire was ignited more than about 4.6 m (15 ft) away*." (Page 54, NISTIR 6196-1)

"*. . . .it appears from the data below that the sprinkler spray influenced the thermal response characteristics of this particular vent, and it is believed that sprinklers could have a similar influence on similar vent designs*." (Page 64, NISTIR 6196-1)

"*Six other tests were performed with the fire at this distance from the vent when the vent was equipped with a fusible link, and in none of these tests did the vent open. . . .Examination of the near-ceiling temperatures from all the tests indicates that sprinklers of this type* [standard spray sprinklers] *have a significant cooling effect, and this will certainly have an effect on thermally-responsive, independently-controlled vents*." (Page 64, NISTIR 6196-1)

"*In Plastic Test P-2, the fire was ignited directly under a vent. In the experiment, flames reached the top of the central array at about 65 s and the vent cavity at about 70 s. The first sprinkler activated at 100 s. The vent did not open at any time during the 30 min test even though another vent 6 m (20 ft) to the west of the unopened vent opened at 6:04*." (Page 64, NISTIR 6196-1)

"*This data, along with the plunge tunnel measurements reported in Section 3.1.4, suggests that the fusible link reached its activation temperature before or at about the same time as the first sprinkler activated, but the link did not fuse. It is not clear whether the link did not fuse because it was cooled directly by water drawn upwards into the vent cavity, or whether the sprinkler spray simply cooled the rising smoke plume enough to prevent the link from fusing. In any event, this phenomenon deserves further study*." (Page 64, NISTIR 6196-1)

"*The mass flow rates* [through the vents] *for Test I-10 and P-5 are relatively low compared with the theoretical maximum because the near-ceiling gas temperatures are greatly reduced by the sprinklers.*" (Page 100, NISTIR 6196-1)

"*The significant cooling effect of sprinkler sprays on the near-ceiling gas flow often prevented the automatic operation of vents. This conclusion is based on thermocouple measurements within the vent cavity, the presence of drips of solder on the fusible links recovered from unopened vents, and several tests where vents remote from the fire and the sprinkler spray activated. In one cartoned plastic commodity experiment, a vent did not open when the fire was ignited directly beneath it.*" (Page 101, NISTIR 6196-1)

In addition to the excerpts from NISTIR 6196-1, Dr. Craig Beyler of Hughes Associates, Inc. (a consultant to the AAMA Smoke Vent Task Group) has also addressed the issue of the opening of roof vents in sprinklered buildings. The following are excerpts from Dr. Beyler's work:

"*The experimental studies have shown that . . . . .current design practices are likely to limit the number of vents operated to one and vents may in fact not operate at all in very successful sprinkler operations.*" (Page 1, "Interaction of Sprinklers with Smoke and Heat Vents")

"*Eliminates Need for Manual Venting? No*" (Page 42, "Sprinkler/Vent Interactions-What people think, what we know, and what we don't.")

"*Not only is the fear of early operation not founded, current design practice will likely lead to 0-1 vents operating*" (Page 61, "Sprinkler/Vent Interactions-What people think, what we know, and what we don't.")

"*Revised design methods for early operation of vents are needed*" (Page 61, "Sprinkler/Vent Interactions-What people think, what we know, and what we don't.")

Obviously, if automatic roof vents do not operate automatically in sprinklered buildings where the sprinkler system is operative and effective, or marginally effective, then the roof vents do little to assist interior manual fire fighting operations and will do little to reduce heat and smoke damage caused by a fire. These points were clearly demonstrated in a fire in a bulk merchandise retail store in Tempe, Arizona on March 19, 1998.

In the bulk merchandise retail store fire in Tempe, the sprinkler system operated, but was inadequate for the hazard being protected and was failing. (A total of 66 large orifice sprinklers operated in the fire. The hydraulic calculations for the sprinkler system assumed that only 29 sprinklers would operate.) Even though the building was provided with smoke and heat vents per the UFC requirements, the building was filled with smoke from floor to the underside of the roof (with zero visibility at the floor) by the time the Phoenix Fire Department arrived at the building. Based upon the NFPA fire report, only 3 of the 29 roof vents (and one skylight) opened automatically and a ladder company had to be sent to the roof to open the other vents.

The NFPA report on this fire in Tempe indicates that the smoke and heat vents had been disabled (although 3 vents did operate automatically), however, this fire clearly shows that smoke and heat vents can be completely ineffective in providing visibility for fire fighters where too few vents open. This finding, coupled with the finding from the NFPRF tests that sprinkler operation will limit the maximum number of vents opening to one, if any vents open at all, indicates that the performance of automatic roof vents is essentially the same as manually-opened vents, except where the sprinkler protection is impaired and fails to discharge water (i.e. closed water supply control valve, broken piping or a pump fails to start).

Where a sprinkler system protecting a large single-story building is impaired and fails to discharge water, the recommendations contained in NIOSH 2005-132, "Preventing Injuries and Deaths of Fire Fighters due to Truss System Failures" are applicable. NIOSH 2005-132 contains the following recommendations regarding interior manual fire fighting operations in buildings constructed with trusses (and other light-weight roof construction typically used in large single-story storage and industrial buildings):

"*Fire fighters should be discouraged from risking their lives solely for property protection activities.*" (Page 7)

"*Lives will continue to be lost unless fire departments make appropriate fundamental changes in fire-fighting tactics involving trusses.*" (Page 8)
"*NIOSH recommends that fire departments, fire fighters, building owners, and managers take steps to minimize the risk of injury and death to fire fighters during fire fighting operations involving structures with truss floor and roof systems. . . .*" (Page 8)

"*Use defensive strategies whenever trusses have been exposed to fire or structural integrity cannot be verified. Unless life-saving operations are under way, evacuate fire fighters and use an exterior attack.*" (Page 9)

Comments contained in the initial report from the FEMA Firefighter Life Safety Summit held in Tampa on April 14, 2004 also address interior manual fire fighting in buildings both large and small. The following is an excerpt from the report:

"*The willingness of firefighters to risk their own lives to save others must never be used as an excuse to take unnecessary risks. Firefighters are highly respected for being willing to risk their own lives to save others, but that cannot justify taking unnecessary risks in situations where there is no one to save and nothing to be gained. In too many cases firefighters lose their lives while trying to save property that is already lost or to rescue victims who are already dead. While these efforts are valiant, they are also futile. Individual firefighters who take unnecessary risks, or fail to follow standard safety practices, endanger their own lives as well as the lives of other fire fighters who are depending on them or who might have to try to rescue them.*"

Based upon the excerpts from NIOSH 2005-132 and the FEMA Firefighter Life Safety Summit above, it can be concluded that interior manual firefighting operations are no longer recommended in buildings with unprotected (non-rated) roof construction in the event the sprinkler system protecting the building is impaired and fails to discharge water. It can also be concluded that sending firefighters to the roof to open unopened automatic roof vents in buildings with unprotected (non-rated) roof construction is not recommended.

To summarize, fire testing conducted at Underwriters Laboratories in 1997 and 1998 determined that automatic roof vents will not automatically open in sprinklered buildings (if the sprinkler protection is effective or marginally effective in controlling the fire) and NIOSH 2005-132 recommends against interior manual firefighting in buildings with unprotected (non-rated) roof construction where the sprinkler - protection is impaired and fails to discharge water. In other words, the two basic reasons why the UFC ad hoc committee on high-piled storage recommended that the installation of roof vents be mandated, to assist interior manual firefighting operations and to reduce heat and smoke damage, are no longer valid. Given this, the need to continue to mandate the installation of automatic roof vents is certainly questionable.

Two other issues which the code changes committee for the Fire Code requested to be addressed in the last code change cycle are fire extinguishment and occupant safety in large single-story buildings. The issue of fire extinguishment in large single-story buildings is addressed in two excerpts from NFPA 13:

> **"*Sprinkler protection installed as required in this standard is expected to protect the building occupancy without supplemental fire department activity.*"**
>
> **"*During the testing program, the installed automatic extinguishing system was capable of controlling the fire and reducing all temperatures to ambient within 30 minutes of ignition.*"**

Given the above, sprinkler protection which is properly designed, installed and maintained is capable of doing the firefighting in large manufacturing and storage buildings in 30 minutes or less. Fire fighters only need to support the sprinkler system by supplying the fire department connection. (It should be noted that no fire fighter fatalities occurred in buildings which were protected throughout by a sprinkler system in either 2005 or 2006.)

With respect to the occupant fire safety issue, large single-story storage and industrial buildings protected by a sprinkler system are extremely "safe" buildings. While fire fatalities have occurred in these types of facilities, the fatalities are typically due to either occupants being intimate with the fire source or due to explosions. Once again, the admonition from the Firefighter Life Safety Summit quoted above should be considered.

The code change proposal substantially modifies the provisions contained in Section 910. In buildings protected by a sprinkler system, five design options for providing (post-fire) ventilation for use by the fire service are provided. It is specifically intended that all five of these options be used after fire control and extinguishment by the sprinkler system. This proposal retains the requirement to provide automatic roof vents as previously required for buildings which are not protected by a sprinkler system.

The proposal for four new design options to provide ventilation for the building is based upon the fact that it is highly unlikely that automatic smoke and heat vents will operate in a building provided with sprinkler protection. Hence, automatic smoke and heat vents will actually function in the same manner as manually-operated roof vents.

The option to provide a mechanical smoke exhaust system is based upon the present provisions for such systems already included in section 910, however, the exhaust rate required has been reduced by two-thirds and the protection of the electrical power supply has been reduced from 15 minutes to 5 minutes. The required exhaust rate has been reduced because the efficiency of roof vents after the fire has been extinguished will be reduced (due to the reduced temperature differential at the vent). The requirements for protection of the power supply for the exhaust fans from high temperatures has been reduced to 5 minutes because sprinkler operation should provide more than adequate protection for the power supply. If the operation of sprinklers can prevent automatic smoke and heat vents from opening, then the operation of sprinklers should provide more than adequate protection for a minimally protected power supply.

The other two options to provide post-fire ventilation consist of exterior wall openings. Again, the standard by which the effectiveness of exterior wall openings should be measured is the effectiveness of roof vents after the fire has been controlled and extinguished. Given that the entire building will be cooled to ambient temperatures after the operation of the sprinkler system, roof venting will not be a very efficient method of ventilating the building. The effectiveness of exterior wall openings to provide ventilation should be judged based upon the level of effectiveness provided by roof vents.

For over 20 years, owners of large warehouses and industrial buildings in the United States have been required by building and fire codes to provide a highly ineffective means of providing fire protection. Adoption of this code change will finally allow building owners to provide building fire protection based upon good fire protection practice, rather than fire protection practice based on myth. It is unfortunate that previous proposals to delete the requirement for roof vents and draft curtains were not approved due to a lack of understanding by the fire service on how roof vents function in sprinklered buildings. Over the years, billions of dollars have been wasted on providing automatic roof vents and draft curtains in sprinklered buildings. This is an excellent example of what can happen when code provisions are developed based upon emotion, rather than utilizing an engineering approach to building fire protection.

Bibliography:

1. "Sprinkler, Smoke & Heat Vent Interaction-Large Scale Experiments and Model Development" (NISTIR 6196-1), Kevin B. McGrattan, Anthony Hamins and David Stroup, National Institute of Standards and Technology (NIST), September, 1998.

   http://www.fire.nist.gov/bfrlpubs/fire98/PDF/f98069.pdf

2. "Interaction of Sprinklers with Smoke and Heat Vents", Craig L. Beyler and Leonard Y. Cooper, Hughes Associates, Inc., February, 1999.
   http://www.haifire.com/publications/Paper21.pdf
3. "Sprinkler/Vent Interactions-What people think, what we know, and what we don't." Craig Beyler, Hughes Associates, Inc., undated presentation.
   http://www.haifire.com/presentations/Sprinkler%20Vent%20Interactions%20-%20NFPA%202000.pdf
4. "Preventing Injuries and Death of Fire Fighters due to Truss Failures", NIOSH 2005-132, National Institute of Occupational Safety and Health (NIOSH), April, 2005.
   http://www.cdc.gov/niosh/docs/2005-132/pdfs/2005-132.pdf
5. "Firefighter Life Safety Summit Initial Report", National Fallen Firefighters Foundation and United States Fire Administration, April 14, 2004.
   http://www.firehero.org/s567/images/Initial_Summit_Report.pdf
6. Standard on Sprinkler Systems (NFPA 13), National Fire Protection Association.

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

Committee Action: Disapproved

Committee Reason: The committee expressed a number of concerns with the proposal, among them that smoke and heat vents help to increase firefighter safety by providing an alternative to allow firefighters to ventilate the building without having to go to the roof. In Section 910.3.1, Items 4 and 5 will decrease in value and effectiveness as the building size increases and the openings can be obstructed by storage inside the building. Section 910.4 removes separation from lot lines and fire walls which could lead to venting onto adjacent property. Finally, it was felt that, since the subject is being studied by the ICC Code Technology Committee, any form of approval would be premature.

Assembly Action: None

Individual Consideration Agenda

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

Public Comment:

Richard Schulte, Evanston, IL, representing himself, requests Approval as Submitted.

Commenter's Reason: The Committee's rationale for disapproving this proposal is flawed. As was clearly documented in the reason statement submitted with the proposal, automatic roof vents often do not open automatically in buildings protected by standard spray sprinklers (if the sprinkler system is operative and is adequate to control the fire). Hence, there is no real difference between automatic roof vents and manual roof vents. A fire which occurred in Tempe, Arizona on March 19, 1998 clearly demonstrated that, if an insufficient number of automatic roof vents do not open, then the roof vents will not maintain visibility at the floor of the building.

Since NIOSH 2005-132 clearly recommends that fire fighters should not go on the roof to open automatic roof vents which do not open automatically (due to sprinkler activation), providing automatic roof vents does not assist fire fighters until after the fire is controlled and extinguished. Based upon this, it can be concluded that the alternates listed in this proposal will accomplish the same level of fire protection with respect to fire fighter safety as providing automatic roof vents.

With respect to the ICC Code Technology Committee (CTC) study of this issue, the CTC held a debate on the issue at its meeting in Baltimore on May 22, 2008. The proponent of this change presented the rationale for why this code section is flawed, including documentation that the automatic roof vents do not operate properly in buildings protected by standard spray sprinklers. Speakers representing the roof vent manufacturers did not refute or rebut any of the information which was presented that automatic vents do not operate automatically. In fact, the proponent of this proposal presented information that the consultant for the roof vent manufacturers, Dr. Craig Beyler of Hughes Associates, Inc., actually agrees that automatic vents do not operate properly in buildings protected by standard spray sprinklers. If the consultant for the vent manufacturers agrees that automatic roof vents do not operate in buildings protected by standard spray sprinklers, then there is no reason why the Committee should disagree with the vent manufacturers' consultant.

Lastly, the Committee heard testimony at the hearing which was erroneous. Jesse Beitel of Hughes Associates, Inc. stated in his testimony that HAI had done a modeling study of an 80,000 square foot building and the modeling study indicates that "vents work". Beitel did not state the number of vents that HAI assumed opened, nor did Beitel state how HAI determined the time at which the vents opened. Research sponsored by the National Fire Protection Research Foundation clearly indicates that fire models can not predict the activation time of roof vents in buildings protected by sprinklers. (In fact, in one large-scale test conducted, a fire was ignited directly underneath a vent and the vent did not open at any time during the 30 minute test. The reason the vent did not open was because of the activation of sprinklers.) Clearly, the Committee heard testimony which was factually in error-vents do not operate properly in buildings protected by standard spray sprinklers.

Final Action: AS AM AMPC____ D

F205-07/08
1027.1

Proposed Change as Submitted:

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

Revise as follows:

1027.1 General. Means of egress in existing buildings shall comply with ~~Sections 1003 through 1026, except as amended in Section 1027.~~ the requirements of Section 1027 and the building code that applied at the time of construction. Where these provisions conflict, the most restrictive provision shall apply.

For existing buildings that were not required to comply with a building code at the time of construction, such buildings shall comply with the requirements of Section 1027 and, in addition, shall have a life safety evaluation prepared, consistent with the requirements of Section 104.7.2. The life safety evaluation shall identify any changes to the means of egress that are necessary to provide safe egress to occupants and shall be subject to review and approval by the fire code official. The building shall be modified to comply with the recommendations set forth in the approved evaluation.

~~**Exception:** Mean of egress conforming to the requirements of the building code under which they were constructed shall be considered as complying means of egress if, in the opinion of the fire code official, they do not constitute a distinct hazard to life~~.

Reason: Section 1027 is intended to provide a minimum level of safety in existing buildings. There are two separate issues that this proposal will correct.

First, the wording in the charging section indicates that an existing building needs to comply with all of Chapter 10 unless modified in Section 1027. This is backwards from the manner in which this should be applied, unless you want every building to comply with all of the egress code changes. For example, Section 1008.1.9 recently changed to require panic hardware on exit doors and exit access doors serving A and E over 50 occupants and all H occupancies. Panic hardware is not addressed in Section 1027, therefore the requirements in

1008.1.9 would apply to all existing occupancies. Additionally, Section 1003.2 recently changed to require a minimum ceiling height of 7'6". An exception to this section is not included in Section 1027, therefore this ceiling height requirement would apply to all existing occupancies. This was not the intent of that code change, therefore, this revision is proposed to the charging section to revise the method of application.

This is not the manner in which it was anticipated that Section 1027 would be applied. The intent was to have the building comply with the code under which it was constructed, and then there are some specific requirements in Section 1027 that would bring SOME of the egress components up to a minimum level of safety. These revisions will provide a consistent method of application of the egress requirements to existing buildings and establish a minimum level of safety in all existing structures.

Second, the provisions in this section are only intended to apply to existing buildings and regulate the egress components which are considered necessary to provide a minimum level for adequate evacuation. This section should not still be subject to the necessity of the code official making a determination of distinct hazard. Therefore, the exception is deleted.

When a building was constructed without compliance with a building code, then the building must comply with the requirements in Section 1027 and must also have an evaluation completed to determine if other modifications are necessary to provide a minimum level of egress safety.

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

Analysis: This proposal is based on Section 1027 – Means of Egress for Existing Buildings of the IFC 2006 edition.

Committee Action: **Approved as Modified**

Modify the proposal as follows:

1027.1 General. Means of egress in existing buildings shall comply with the requirements of Section 1027 and the building code that applied at the time of construction. Where these provisions conflict, the most restrictive provision shall apply.

~~For existing buildings that were not required to comply with a building code at the time of construction, such buildings shall comply with the requirements of Section 1027 and, in addition, shall have a life safety evaluation prepared, consistent with the requirements of Section 104.7.2. The life safety evaluation shall identify any changes to the means of egress that are necessary to provide safe egress to occupants and shall be subject to review and approval by the fire code official. The building shall be modified to comply with the recommendations set forth in the approved evaluation.~~

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change, which provides needed clarification of the true intent of the code with respect to means of egress requirements for existing buildings. The modification removes what was viewed as an unneeded paragraph that references Section 104.7.2 for requirements when that section has no requirements. Also, a life safety evaluation can be currently required by Section 104 in cases where no original construction code information is available.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee, requests Approval as Modified by this public comment.

Further modify proposal as follows:

1027.1 General. Means of egress in existing buildings shall comply with the requirements of Sections 1027.2 through 1027.21 and the building code that applied at the time of construction. Where these provisions conflict, the most restrictive provision shall apply.

Existing buildings that were not required to comply with a building code at the time of construction shall comply with the minimum egress requirements in Sections 1027.2 through 1027.21.

Commenter's Reason: The committee Approved as Modified this item in Palm Springs. The modification removed the portion of the section which deals with buildings constructed without benefit of a building code. This Public Comment will insert direction for handling egress in these buildings.

The intent of Section 1027 was to have the building comply with the code under which it was constructed, and then there are some specific requirements in 1027 that would bring SOME of the egress components up to a minimum level of safety. These revisions will provide a consistent method of application of the egress requirements to existing buildings and establish a minimum level of safety in all existing structures.

When a building was constructed without compliance with a building code, then the building must comply with the minimum requirements in Section 1027.

Final Action: AS AM AMPC____ D

F207-07/08
1027.17, 1027.17.1 (New), 1027.17.2 (New)

Proposed Change as Submitted:

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

Revise as follows:

1027.17 Corridors. Corridors in existing buildings shall comply with the requirements in 1027.17.1 and 1027.17.2.

1027.17.1 Corridors in other than Group I-2. In other than Group I-2 occupancies, ~~Corridors~~ corridors serving an occupant load greater than 30 and the openings therein shall provide an effective barrier to resist the movement of smoke. Transoms, louvers, doors and other openings shall be closed or be self-closing.

Exceptions:

1. Corridors in occupancies other than in Group H, which are equipped throughout with an approved automatic sprinkler system.
2. ~~Patient room doors in corridors in occupancies in Group I-2 where smoke barriers are provided in accordance with the International Building Code.~~
3. Corridors in occupancies in Group E where each room utilized for instruction or assembly has at least one-half of the required means of egress doors opening directly to the exterior of the building at ground level.
4. 3. Corridors that are in accordance with the *International Building Code*.

1027.17.2 Corridors in Group I-2. In Group I-2 occupancies, corridors and the openings therein shall provide an effective barrier to resist the movement of smoke. Transoms, louvers, doors and other openings shall be closed or be self-closing.

Exceptions:

1. Patient room doors in corridors are not required to be self-closing where smoke barriers are provided in accordance with the *International Building Code*.
2. Gift shops less than 500 square feet (46.5 m^2) in area shall be allowed to be open to the corridor provided the gift shop and storage areas are sprinklered in accordance with Section 903.
3. Spaces for doctors' and nurses' charting, communications and related clerical areas area allowed to be open to the corridor, when such spaces are constructed as required for corridors.
4. Areas wherein mental health patients who are not capable of self-preservation are housed, or group meeting or multipurpose therapeutic spaces other than incidental use areas as defined in IBC Section 508.2, under continuous supervision by facility staff, shall be allowed to be open to the corridor, where the following criteria are met:
   - 4.1. Each area does not exceed 1,500 square feet (140 m^2).
   - 4.2. The area is located to permit supervision by the facility staff.
   - 4.3. The area is arranged so as not to obstruct any access to the required exits.
   - 4.4. The area is equipped with an automatic fire detection system installed in accordance with Section 907.3.2.2 (Supp).
   - 4.5. Not more than one such space is permitted in any one smoke compartment.
5. Waiting areas and similar spaces constructed as required for corridors shall be permitted to be open to a corridor, only where all of the following criteria are met:
   - 5.1. The spaces are not occupied for patient sleeping units, treatment rooms, hazardous or incidental use areas as defined in IBC Section 508.2.
   - 5.2. The open space is protected by an automatic fire detection system installed in accordance with Section 907.3.2.2 (Supp).
   - 5.3. The corridors into which the spaces open, in the same smoke compartment, are protected by an automatic fire detection system 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.
   - 5.4. The space is arranged so as not to obstruct access to the required exits.

(Renumber subsequent sections)

Reason: This proposal applies only to existing Group I-2 occupancies. It will require that all corridors in existing I-2 occupancies be constructed as a smoke barrier. This requirement will resist the passage of smoke and maintain a higher level of safety in the I-2 occupancies.

According to a study completed in 2005 for the National Fire Protection Association, Kimberly D. Rohr and John R. Hall, Jr., of the Association's Fire Analysis and Research Division, the average number of civilian deaths in health care facilities for the aged or sick is 4.9 per one thousand fires. The increased level of protection for the corridor will allow more time for the staff to relocate and evacuate patients while the atmosphere is still tenable.

The requirements come from the IBC Section 407.2, but are not as restrictive as those for new construction. These provisions will provide for an increased level of life safety to protect the patients.

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

Committee Action: Disapproved

Committee Reason: The proposal was disapproved because the committee felt that its retroactive requirements would be an onerous burden on existing buildings, and that they would be more restrictive that the requirements for new construction. It was also noted that the action taken approving code change F154-07/08, if sustained in the final action, would require retroactive sprinklering of Group I-2 which should be taken into account.

Assembly Action: None

Individual Consideration Agenda

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

Public Comment:

Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee, requests Approval as Modified by this public comment.

Modify proposal as follows:

1027.17 Corridors. Corridors in existing buildings shall comply with the requirements in 1027.1 and 1027.2.

1027.17.1 Corridors in other than Group I-2. In other than Group I-2 occupancies, corridors serving an occupant load greater than 30 and the openings therein shall provide an effective barrier to resist the movement of smoke. Transoms, louvers, doors and other openings shall be closed or be self-closing.

Exceptions:

1. Corridors in occupancies other than in Group H, which are equipped throughout with an approved automatic sprinkler system.
2. Corridors in occupancies in Group E where each room utilized for instruction or assembly has at least one-half of the required means of egress doors opening directly to the exterior of the building at ground level.
3. Corridors that are in accordance with the *International Building Code*.

1027.17.2 Corridors in Group I-2. In Group I-2 occupancies, corridors and the openings therein shall ~~provide an effective barrier to~~ resist the movement of smoke. Transoms, louvers, doors and other openings shall be closed or be self-closing.

Exceptions:

1. Patient room doors in corridors are not required to be self-closing ~~where smoke barriers are provided in accordance with the *International Building Code*~~.
2. Gift shops less than 500 square feet (46.5 m^2) in area shall be allowed to be open to the corridor provided the gift shop and storage areas are sprinklered in accordance with Section 903.
3. Spaces for doctors' and nurses' charting, communications and related clerical areas area allowed to be open to the corridor, when such spaces are constructed as required for corridors.
4. Areas wherein mental health patients who are not capable of self-preservation are housed, or group meeting or multipurpose therapeutic spaces other than incidental use areas as defined in IBC Section 508.2, under continuous supervision by facility staff, shall be allowed to be open to the corridor, where the following criteria are met:
   4.1. Each area does not exceed 1,500 square feet (140 m^2).
   4.2. The area is located to permit supervision by the facility staff.
   4.3. The area is arranged so as not to obstruct any access to the required exits.
   4.4. The area is equipped with an automatic fire detection system installed in accordance with Section 907.3.1.3.
   4.5. Not more than one such space is permitted in any one smoke compartment.
5. Waiting areas and similar spaces constructed as required for corridors shall be permitted to be open to a corridor, only where all of the following criteria are met:
   5.1. The spaces are not occupied for patient sleeping units, treatment rooms, hazardous or incidental use areas as defined in IBC Section 508.2.
   5.2. The open space is protected by an automatic fire detection system installed in accordance with Section 907.3.1.3.
   5.3. The corridors into which the spaces open, in the same smoke compartment, are protected by an automatic fire detection system 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.
   5.4. The space is arranged so as not to obstruct access to the required exits.

(Renumber subsequent sections)

Commenter's Reason: This proposal applies only to existing Group I-2 occupancies. It will require that all corridors in existing I-2 occupancies be constructed to resist the passage of smoke. This proposal will require that corridor walls resist the passage of smoke and maintain a higher level of safety in the I-2 occupancies.

This proposal was disapproved by the Code Development Committee because it was unclear as to whether smoke barriers were being required. It was not the intent to require smoke barriers and the language has been revised to eliminate the unclear language which led to that interpretation. Section 1027.17.2 and Exception 1 have been revised. The end result is the same; corridor walls provide a membrane which will resist the passage of smoke.

According to a study completed in 2005 for the National Fire Protection Association, Kimberly D. Rohr and John R. Hall, Jr., of the Association's Fire Analysis and Research Division, the average number of civilian deaths in health care facilities for the aged or sick is 4.9 per one thousand fires. The increased level of protection for the corridor will allow more time for the staff to relocate and evacuate patients while the atmosphere is still tenable.

This Public Comment will provide consistency and correlation of the IFC with mandated Federal Regulations for these facilities. In other words, the Federal Regulations already require corridors to provide resistance to the passage of smoke. Without the inclusion of this information in the IFC, a facility could be approved under the IFC but not be in compliance with the Federal regulations and find out that they need to go back and install revise the corridors. If the IFC contains this requirement, it will eliminate confusion and frustration on the part of the owner/developer and eliminate finger pointing after the code official has "approved" the facility.

Final Action: AS AM AMPC____ D

F208-07/08

1027.17.2 (New), 1002.1 (New)

Proposed Change as Submitted:

Proponent: John Williams, State of WA, Department of Health, Construction Review Services

Add new text as follows:

1027.17.2 Group I-2 corridor width. A minimum effective corridor width of 6 feet (1829 mm) shall be maintained in existing Group I-2 occupancies.

(Renumber subsequent section)

1002.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

EFFECTIVE CORRIDOR WIDTH. The usable width of an existing Group I-2 corridor at any point in time. Effective width is equal to the clear width minus the width occupied by approved equipment essential to the function of the occupancy, including but not limited to, crash carts or resuscitation carts. Approved equipment shall be uniformly located on one side of the corridor.

Reason: The purpose of this code change is to clarify the code. This code section would provide additional resources for the fire code official when determining what constitutes a "distinct hazard to life" . Healthcare occupancies rely on immediate access to emergency medical equipment. Currently, this is a collection of equipment, drugs and resuscitation devices stored on a wheeled crash cart that can be readily relocated in an emergency. This is usually planned for in new facilities, however, older existing facilities may have been built before these practices were common. Access to this equipment is important on a common reoccurring basis. Due to the frequency of need, not having crash cart immediately accessible creates more of a hazard than reducing the usable width of a corridor. Seconds count when accessing this equipment to revive a patient.

Corridor width in hospitals are quite large to accommodate two way bed movement and gurney travel. However, in a evacuation scenario there is no need for two way bed traffic. All beds are moving in the same direction. A 6 foot effective width provide sufficient space to permit bed and gurney traffic, including turning radii for beds into doorways off of the corridor. If a bed needs to reverse direction, it does not need to be turned around – you just push it in a different direction.

Practically, the overall clear width required when the building is constructed is maintained. If these carts become a nuisance during everyday bed movement, the facility will remove them of their own accord. The definition further restricts the location of these carts to one side of the corridor, so that the usable width is continuous.

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

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that its provisions would conflict with new building design requirements and that the term "effective corridor width" is ambiguous. Also, the term "approved equipment" in the definition could cause inconsistent enforcement because it contains no guidance as to what type of equipment is intended and could be interpreted as anything. Established code style is that definitions should not contain technical requirements, which is what the last sentence of the definition is. If wider corridor widths are needed, then it should be part of the new building design.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

John Williams, Construction Review Services, Washington State Department of Health, requests Approval as Modified by this public comment.

Replace proposal as follows:

1028.3 Obstructions. A means of egress shall be free from obstructions that would prevent its use, including the accumulation of snow and ice.

Exception: In Group I-2 corridors, resuscitation carts meant for emergency use shall be allowed to be uniformly located on one side of the corridor, provided that a clear width of six feet is maintained between the cart and the opposite corridor wall.

Commenter's Reason: This public comment is meant to address the committee's concern with terminology. The term has been narrowed from "approved equipment" to "resuscitation cart". The proposed new term and definition was deleted and all of the technical requirements reside in this section. The reference to existing was also deleted to clarify that this would apply to both new and existing Group I-2. This concept was also relocated to the maintenance section of the code for context.

Final Action: AS AM AMPC____ D

F209-07/08
Table 1027.17.2

Proposed Change as Submitted:

Proponent: William E. Koffel, Koffel Associates, Inc.

Revise table as follows:

TABLE 1027.17.2
COMMON PATH, DEAD-END AND TRAVEL DISTANCE LIMITS (by occupancy)

OCCUPANCY	COMMON PATH LIMIT		DEAD-END LIMIT		TRAVEL DISTANCE LIMIT	
	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)
Group E	75	75	20	~~20~~ 50	200	250
Group I-1	75	75	20	~~20~~ 50	200	250
Group U	75	75	20	~~20~~ 50	200	250

(Portions of table and footnotes not shown remain unchanged)

Reason: The allowance of 50 foot dead-end corridors in fully sprinkler protected Group E, Group I-1, and Group U buildings is consistent with other national codes, including the 2006 Edition of NFPA 101 Table A.7.6, the 2006 Edition of NFPA 5000, the 2006 Edition of the International Existing Building Code (2006 IEBC), and Section 1017.3 of the 2007 Supplement to the 2006 International Fire Code (IFC) and the 2006 International Building Code (IBC). In other than Group A and H occupancies, the 2006 IEBC permits newly created dead-end corridors of 50 feet on floors protected with an automatic sprinkler system in accordance with the 2006 International Building Code (IBC) for Alterations – Level 2 (605.6 exc. 4) and Alterations – Level 3 (705.1). In addition, Section 812.4.1.1 (Means of egress for change in occupancy to higher hazard) of the 2006 IEBC references Section 605.6 for existing dead-end corridors. Further, when the change of occupancy complies with Section 812.3 of the 2006 IEBC, Section 812.4.1.2 (Means of egress for change of use to equal or lower hazard category) of the 2006 IEBC allows existing dead-end corridors no matter what length to remain regardless of the presence of an automatic sprinkler system. Further, because of the 2007 Supplement language to Section 1017.3 of the 2006 IFC, there is now a conflict within the IFC itself for means of egress. The Supplement language for Section 1017.3 of the IFC and for Section 1017.3 of the IBC permits dead-end corridors of 50 feet in Group E, Group I-1, and Group U buildings with an automatic sprinkler system in accordance with Section 903.3.1.1 of both codes, respectively.

Once a new building is given its Use & Occupancy approval, any future work in the building can reference the 2006 IEBC and 2006 IFC requirements. The lack of conformity between the dead-end corridor requirements of the 2006 IFC and the 2006 IEBC creates a conflict when future Alteration level work occurs. Amending Table 1027.17.2 of the 2006 IFC to allow 50 foot dead-end corridors in Group E, Group I-1 and Group U buildings, where the building is protected throughout with an automatic sprinkler system in accordance with NFPA 13 requirements allows for consensus between the IFC, the IBC, and the IEBC.

Group U buildings historically do not have significant occupant loads. Occupant load factors and travel distance limitations are consistent with Group F and S occupancies as indicated in Table 1004.1.1 and Table 1016.1 of the 2006 IFC. Further, Table 1027.17.2 of the 2006 IFC permits 50 foot dead-end corridors for Group F and S occupancies regardless of the presence of an automatic sprinkler system. Group U buildings also tend to be smaller than Group F and S buildings.

No new standard is referenced. Existing national standards are referenced. The code change proposal is meant to bring the IFC into consensus with the 2007 Supplement to the IBC, and other national codes.

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

Analysis: This proposal is based on Section 1027 – Means of Egress for Existing Buildings of the IFC 2006 edition.

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change, which will provide correlation with Section 1017.3 for new buildings which was revised by code change E130-06/07 by increasing the dead-end limits to 50 feet in sprinklered Groups E, I-1 and U.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Jonathon D. Hamrick, Florida Department of Education, requests Disapproval.

Commenter's Reason: It is a mistake to increase the maximum allowed dead-end in an educational occupancy from 20 feet to 50 feet in a fully sprinklered building.

A 50 feet long dead-end is an extremely long way for young children, who have short legs and panic easily, to travel in an emergency situation. This increase in dead-end travel distance also increased the time needed to evacuate a building. This increase in dead end travel distance is dangerous for small children. The limit for a dead-end corridor should remain at 20 feet for an educational occupancy.

Final Action: AS AM AMPC____ D

F211-07/08
1027.22 (New)

Proposed Change as Submitted:

Proponent: Gary Lewis, City of Summit, NJ, representing ICC Ad-Hoc Committee on Terrorism Resistant Buildings

Add new text as follows:

1027.22 Exit path markings. Existing buildings of Group A ,B, E, I, M, and R-1 having occupied floors located more than 75 feet (22 860mm) above the lowest level of fire department vehicle access shall have exit path markings in accordance with Section 1027 (Supp).

Reason: The membership, at the final hearings of the 2006/2007 code development cycle, overturned the committee action on E84-06/07 with a two-thirds majority vote to include requirements in the IBC and the IFC for luminous exit path markings. The TRB Ad Hoc committee was the original proponent to this code change and it was our intent to make these requirements retroactive for existing buildings. Our intent was not clear in the original proposal, so, at this time, the TRB Ad Hoc committee is proposing to make these requirements applicable to existing buildings.

The proposed new section on exit path markings will require luminescent exit path markings be provided in existing buildings. This proposal will facilitate rapid egress and assist in full building evacuation and is drawn from Recommendations 17 and 18 of the National Institute of Standards and Technology's (NIST) report on the World Trade Center tragedy.

Up to this point, code requirements for high rise buildings were written under the assumption that the building would be evacuated floor by floor. In most instances, in a building with a full suppression system, only the floor where the fire is located and the floors immediately above and below would be evacuated. Acts of terrorism and accidental incidents like power failures have made it necessary to consider design for full building evacuation that is as rapid as possible. This may be made necessary in response to an event within the building or an event outside the building. The proposed code change to require exit path markings is intended to facilitate the most rapid possible full building evacuation.

In the City of New York, after the first bombing of the WTC, requirements were instituted to require exit path markings in vertical exit enclosures in new and existing buildings. This proposal is taken directly from those requirements.

Bibliography:

1. Reference Standard 6-1, Photoluminescent exit path markings as required by Local Law 26 of 2004, New York City Building Code, § 27-383(b)
2. National Institute of Standards and Technology. Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Cost Impact: The proposal will increase the cost of construction however, the life safety benefit is great.

Analysis: This proposal is based on Section 1027 – Means of Egress for Existing Buildings of the 2006 edition, which will be renumbered to be 1028 in the 2009 edition (due to the addition of new Section 1027 - Exit Path Markings in the 2006/2007 cycle). The reference in this proposal to Section 1027 (Supp) will be to the new Section 1027 in the 2009 edition.

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that it was overbroad and would require immediate compliance in all high-rises of the listed occupancies. Historic buildings, which are very difficult to retrofit, would be included. It was noted that there is no documentation on the cost-effectiveness of these markings in existing buildings and that the NIST report did not discuss requiring egress path markings in existing buildings. The section, in order to be effective, would require retrofitting of exit enclosure illumination in accordance with Section 1027.1.7 of the 2007 Supplement. It was suggested that the IEBC might be a better place to deal with this issue.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Gary Lewis, Chair, ICC Ad Hoc Committee on Terrorism Resistant Buildings, requests Approval as Modified by this public comment.

Modify proposal as follows:

1027.22 Exit path markings. Existing buildings of Group A, B, E, I, M and R-1 having occupied floors located more than 75 feet (22,860 mm) above the lowest level of fire department vehicle access shall be provided with exit path markings in accordance with Section 1027 (Supp).

Exception: Open, unenclosed stairwells in historic buildings designated as historic under a state or local historic preservation program.

Commenter's Reason: This comment is intended to support the requirements for photo luminescent exit path markings in vertical exit enclosures in existing buildings of Group A, B, E, I, M and R-1. This same language, minus the exception for historic structures, was already approved by the membership as the standard in the IBC for all newly-constructed high rises.

In situations where building evacuation is necessary, it is not unusual for power to be lost, rendering stairwells darker than when lit. If criminal intent was involved, stairway lighting may be one of the first targets to deactivate. Emergency lighting can leave dark spots in stairwells as well. Occupants may move slower than egress model plans for the building as a result, also confirmed by the study by recent research.

Photoluminescent markings (PLM) have been proven to improve occupant egress in buildings. Research has shown a marked improvement in egress time when PLM's are present in buildings vs. unmarked unlit stairwells.1 From 65-75% of building occupants using stairwells with PLM's felt comfortable going town the stairwells with PLM and reduced lighting. Additionally the speed of movement in this study showed an improvement in speed to egress the building. Handrail marking seemed to help considerably.

A perceived emergency situation requiring evacuation brings an amount of stress to occupants. Building egress systems can often be complex and non-intuitive to users. 2 Adding comfort of occupants during this difficult and stressful emergency evacuation egress situation may reduce stress keeping occupants focused on the task of negotiating the stairway and transfer corridors, with very clear pathways marked for egress more frequently than exit signs.

Products and information on the process for installation of PLM's exist due to New York City's mandate retroactively in 2004. Surface preparation for adhesive backed systems and discussion about mechanically fastened systems has been taking place in leading groups like the Society of Fire Protection Engineers.3

Some compromises were made from the original proposal as existing buildings can be a bit more challenging when retrofitting passive life safety systems. The compromises were made based on the February 18 – March 1, 2008 Public Hearings on the 2006 Edition of the International Fire Code Committee Hearing results. The hearing results noted that this proposal was disapproved based on the fact that the committee determined it to be "overbroad and would require immediate compliance in all high-rises of the listed occupancies." Of particular importance, the committee noted that "Historic buildings, which are very difficult to retrofit, would be included." The Ad Hoc committee concurs with the concerns and has adjusted the proposal accordingly.

The Committee has modified F211 to take into account the aesthetics and possible natural light in an open, unenclosed stairway, in a historic building. Also, the requirement is only applicable to buildings above 75 feet above the lowest level of the fire department access, so the requirement has limited application in the first place within these historic structures.

Photo luminescent exit path markings will facilitate quick egress from buildings during full building evacuation, regardless of emergency or non-emergency conditions. This type of marking is similar to what is currently used in the airline industry to evacuate large aircraft. It has been proven to work in the airline industry, and it will work in the building industry too. Photo luminescent markings in the vertical exit enclosures will not only help to illuminate the exit path, it will provide clear guidance on the travel direction for exiting the building.

This proposal also in alignment with the NIST recommendation number 18 on egress system be designed items (2) "to maintain their functional integrity and survivability under foreseeable building-specific or large-scale emergencies" and (3) "with consistent layouts, standard signage, and guidance so that systems become intuitive and obvious to building occupants during evacuations

The marking requirement is only applicable to those buildings that have occupied floors exceeding 75 feet above the lowest level of fire department vehicle access. The cost impact on existing buildings is minor when considering the life safety benefit. Therefore, it is logical and affordable to extend this same level of protection provided new high rise structures, to existing high rise buildings.

1. Evaluation and comparison of different installations of photoluminescent marking on stairwells of a high rise building. N. Benichou, Proulx, G, Sept. 3-5, 2007.

2. The Human Factor: building designers often forget how important the reactions of the human occupants are when they specify fire and life safety systems. Proulx., G; Richardson, J.K., May, 2002
3. Escape from New York, "The use of Photoluminescent pathway-marking Systems in High-Rise, James D. Amy, Jr., PE, Rolf Jensen Assoc., FPE Magazine Archives, Emerging Trends Newsletter, December, 2006.

Final Action: AS AM AMPC____ D

F212-07/08
1028.2

Proposed Change as Submitted:

Proponent: John Woestman, The Kellen Company, representing Door Safety Council

Revise as follows:

1028.2 Reliability. Required exit accesses, exits or exit discharges shall be continuously maintained free from obstructions or impediments to full instant use in the case of fire or other emergency when the areas served by such exits are ~~occupied~~ subject to normal use and occupancy. Security devices affecting means of egress shall be subject to approval of the fire code official.

Reason: This proposal clarifies the requirements to ensure emergency escape in the event of a fire or other emergency.

One of the most common violations of the IFC is exits that have impediments to full instant use. For example, it is not unheard of for building managers to “lock in” the night shift custodial crew or the restocking crew with ad-hoc devices which impede full instant use in the event of a fire emergency. Individuals have the same right to emergency egress as those within the building at other times. Custodial work and restocking activities, and other similar activities, should always be considered normal use and occupancy of the building. The unintended consequences of the current language have allowed secondary devices that impede full instant use of exits.

This code change is not intended to result in compromises in building security. This proposal is intended to help ensure security devices affecting the means of egress be subject to approval by the fire code official to enable all individuals in the building to have full instant use of exits in case of fire or other emergency.

The term “occupied” occurs frequently in the IFC and is used in various contexts. Unfortunately, “occupied” is not defined in the IFC. Granted, a definition of “occupied” would not be brief because of the multiple contexts of the use of the term. Without an explicit definition of “occupied” in the code, a common English definition should be the default. However, an outstanding factor of interpretation and compliance may be the use of “occupied” from NFPA 101 which defines a building as occupied "any time it is open for general occupancy, any time it is open to the public, or at any other time it is occupied by more than 10 persons."

Our proposal removes the potentially ambiguous term “occupied” in favor of “subject to normal use and occupancy”.

This proposal will clarify the requirement for means of egress maintenance. The IFC text has been the subject of several recent proposals and public comments due to the apparent contradiction in the existing language. The modification addresses committee and stakeholder concerns regarding occupied vs. unoccupied buildings.

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

Analysis: This proposal is based on Section 1028 – Maintenance of the Means of Egress of the IFC 2006 edition.

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that the current term "occupied" is well understood as meaning when anyone in the building and that the proposal could create ambiguity and possible dangerous situations of locking exits through its vague terminology.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

John Woestman, The Kellen Company, representing Door Safety Council (DSC), requests Approval as Modified by this public comment.

Modify proposal as follows:

1028.2 Reliability. Required exit accesses, exits, ~~or~~ and exit discharges shall be continuously maintained free from obstructions or impediments to full instant use in the case of fire or other emergency when one or more persons occupy the area~~s~~ served by such ~~exits~~ means of egress ~~are subject to normal use and occupancy~~. Security devices affecting means of egress shall be subject to approval of the fire code official.

Commenter's Reason: The proposed changes clarify and are intended to improve the enforceability of this paragraph of the code.

The one-word proposed change revises the language to reflect the intent of the code in that all three of the critical parts of the means of egress need to meet the "full instant use" reliability requirements of the code. Technically, without this change this paragraph of the code would be satisfied if one of the three separate and distinct parts of a means of egress is maintained free from obstructions or impediments to full and instant use.

The second revision clarifies that each and every person in a building is entitled to emergency escape. One of the most common violations of the fire code is means of egress that have impediments to full instant use. This proposed change also addresses the concern expressed by the committee during the committee hearings in California.

The third revision more accurately notes that areas of buildings are served by means of egress (which includes the exit).

The text deleted at the end of sentence was part of the original F212 proposal and its deletion is appropriate as part of this proposed modification.

The Door Safety Council recommends "Approval as Modified by this Public Comment" at the Final Action Hearings.

Final Action: AS AM AMPC____ D

F213-07/08
1028.8 (New)

Proposed Change as Submitted:

Proponent: Wayne R. Jewell, Chair, Hazard Abatement in Existing Buildings Committee

Add new text as follows:

1028.8 Unsafe conditions. The following conditions shall be deemed unsafe and shall be replaced or repaired to comply with Section 1003 through 1026, except as amended in Section 1027:

1. The width of a means of egress is reduced such that it inhibits safe passage;
2. Ceiling surfaces have evidence of wear, improper height or deterioration such that they inhibit safe passage;
3. Protruding objects of improper height such that they inhibit safe passage;
4. Floor surfaces that have evidence of wear or deterioration such that they inhibit safe passage;
5. Exit signs and markings that are not functioning or have become dislodged or obstructed;
6. Means of egress illumination that is not functioning or has become dislodged or obstructed;
7. Guards or handrails that have evidence of wear or deterioration such that they inhibit safe passage;
8. Means of egress components, including but not limited to, doors, gates, stairs, ramps and exterior balconies that are not capable of providing safe passage.

Reason: The ICC Board approved the development of new code requirements in the I-Codes which address hazards, such as those from fire, as well as, the development of requirements relative to issues such as hazardous conditions due to structural issues. This would provide code requirements for all disciplines to be used by building owners to bring their existing building stock up to minimum standards and enforcing agencies when performing inspections of existing buildings. The Hazard Abatement of Existing Buildings Committee (HAEB) was formed to develop these requirements.

During this 07/08 cycle, the HAEB committee is proposing several unsafe conditions requirements for inclusion within the text of the existing International Codes, predominately the *International Property Maintenance Code* and the *International Fire Code*.

The purpose of this proposal is to add a new section that is intended to clarify to fire code officials, designers, contractors and property owners the minimum maintenance requirements for all components of the means of egress and if they are not maintained they should be considered unsafe conditions as inadequate means of egress. These unsafe conditions require a fire code official to issue a notice or order as stated by the current language in Section 110.1. That order is requiring corrective actions on the part of the owner, operator, occupant, or other person responsible for the condition or violation. Presence of violations in these portions of a building could represent such significant hazard that their presence makes occupancy of the building or portion there of unsafe. If this were the case it is possible that all or a portion of the building or structure might need to be evacuated as provided by Section 110.2.

During the 06/07 code change hearings it was argued that the provisions outlined above were subjective and unenforceable. Currently there is no basis to determine what Section 110.1.1 declares as inadequate means of egress. The above enumerated conditions do have a basis to be evaluated based on current provision in the IBC and can be determined by a code official. As example:

1. Width of a means of egress should be clearly evident and if it has been narrowed that also should be clearly evident. It is possible that alteration without permit has occurred to such an extent that the narrowing of a corridor, aisle or passageway is not readily evident, but minimum widths are not present or required widths to accommodate the occupant load within the building no longer exist. The width of a means of egress may also be reduced by the placement of furniture or other objects in the required width of the exit path.
2. Minimum ceiling height is clearly stated within the provisions of Section 1003.2. A deteriorating ceiling can be a ceiling that has hanging or loose assemblies could or are likely to fall. These hanging objects could not be low enough to be considered protruding objects. A deteriorated ceiling could allow the corridor to become an element of the ventilation system, Section 1017.4.
3. Limits of what is protruding are identified in various Sections of the code such as 1003.3 and 1008.1.1.1.
4. Floor surfaces are to be level, slip resistant and securely attached. Those that don't meet those provisions are deteriorated and create unsafe conditions by creating a tripping hazard.
5. The failure of bulbs or batteries that result in exit signs not being illuminated removes an essential notification of exit direction for occupants. Certain older signs also include arrow inserts for direction that can be dislodged.
6. See item 5.

7. Loose guards and handrails do not provide the intended level of support for occupants. Deterioration may be such that occupants would avoid grasping railings for support.

This sampling of code provisions that support this listing should be evidence that the provisions are not subjective and reflect requirements of the code without creating a laundry list of code sections. Further these provisions provide a objective basis for the determination of what is or isn't "inadequate means of egress" as stated in Section 110.1.1 Unsafe Conditions.

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

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that it creates an undesirable "laundry list" that could result in "unequal violations" by creating the perception of elevating the listed items higher than others. It was also observed that the charging text could be construed as an unsafe building declaration and that the proposal would make good commentary.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Wayne R. Jewell, Chairman, ICC Hazard Abatement in Existing Buildings Committee, requests Approval as Modified by this public comment.

Modify proposal as follows:

1028.8 Unsafe conditions. ~~The following~~ Conditions that impede safe passage through the means of egress shall be deemed unsafe and shall be replaced or repaired to comply with Section 1003 through 1026, except as amended in Section 1027. Such conditions shall include, but not be limited to:

1. The width of a means of egress is reduced such that it inhibits safe passage;
2. Ceiling surfaces have evidence of wear, improper height or deterioration such that they inhibit safe passage;
3. Protruding objects of improper height such that they inhibit safe passage;
4. Floor surfaces that have evidence of wear or deterioration such that they inhibit safe passage;
5. Exit signs and markings that are not functioning or have become dislodged or obstructed;
6. Means of egress illumination that is not functioning or has become dislodged or obstructed;
7. Guards or handrails that have evidence of wear or deterioration such that they inhibit safe passage;
8. Means of egress components, including but not limited to, doors, gates, stairs, ramps and exterior balconies that are not capable of providing safe passage.

Commenter's Reason: While the committee expressed concerns that "laundry lists" may create the impression that some violations are more important than others, the intention is to set forth a list of conditions that are so egregious in their affect on exiting that their very presence creates an unacceptable threat to life safety.

Final Action: AS AM AMPC____ D

F220-07/08

1803.16 (New), 1803.16.1 (New), 1802.1 (New), 3704.1.2, 3704.1.3

Proposed Change as Submitted:

Proponent: Ron Fuhrhop, Praxair, Inc.

1. Add new text as follows:

1803.16 Subatmospheric Gas Delivery Systems. Subatmospheric Gas Delivery Systems (SAGDS) shall meet all of the requirements for HPM gases, except as provided for in Section 1803.16.1.

1803.16.1 Ventilation. Ventilation inside an exhausted enclosure or gas cabinet containing SAGDS shall be sufficient to maintain vapors within the enclosure or cabinet below 25 percent of the lower explosive limit (LEL) and below IDLH, based on approved release rate calculations provided by the SAGDS manufacturer.

1802.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

SUBATMOSPHERIC GAS DELIVERY SYSTEM (SAGDS). A system that includes a gas container which under normal operating conditions allows for gas flow only when the container outlet is exposed to subatmospheric pressure.

2. Revise as follows:

3704.1.2 Gas cabinets. Gas cabinets containing highly toxic or toxic compressed gases shall comply with Section 2703.8.6 and the following requirements:

1. The average ventilation velocity at the face of gas cabinet access ports or windows shall not be less than 200 feet per minute (1.02 m/s) with a minimum of 150 feet per minute (0.76 m/s) at any point of the access port or window.

   Exception: For Subatmospheric Gas Delivery Systems (SAGDS) in accordance with Section 1803.16.1.

2. Gas cabinets shall be connected to an exhaust system.
3. Gas cabinets shall not be used as the sole means of exhaust for any room or area.
4. The maximum number of cylinders located in a single gas cabinet shall not exceed three, except that cabinets containing cylinders not over 1 pound (0.454 kg) net contents are allowed to contain up to 100 cylinders.
5. Gas cabinets required by Section 3704.2 or 3704.3 shall be equipped with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Alternative fire-extinguishing systems shall not be used.

3704.1.3 Exhausted enclosures. Exhausted enclosures containing highly toxic or toxic compressed gases shall comply with Section 2703.8.6 and the following requirements:

1. The average ventilation velocity at the face of the enclosure shall not be less than 200 feet per minute (1.02 m/s) with a minimum of 150 feet per minute (0.76 m/s).

   Exception: Subatmospheric Gas Delivery Systems (SAGDS) in accordance with Section 1803.16.1.

2. Exhausted enclosures shall be connected to anexhaust system.
3. Exhausted enclosures shall not be used as the sole means of exhaust for any room or area.
4. Exhausted enclosures required by Section 3704.2 or 3704.3 shall be equipped with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Alternative fire-extinguishing systems shall not be used.

Reason: Item **1** - This code change proposal adds a definition to address the technology of sub-atmospheric gas delivery systems (SAGDS). The proposed definition is consistent to that contained in the 2006 Edition of NFPA 318, Standard for the Protection of Semiconductor Fabrication Facilities. The definition can be found in Section 3.3.27.5.

A primary goal of a SAGDS is to improve safety by reducing the risk of a gas release. The risk is reduced, because SAGDS only deliver gas when a vacuum is applied to the outlet connection. In a SAGDS, the outlet valve can be opened, but no gas is released until the pressure at the outlet connection is below atmospheric pressure. This is in contrast to a typical gas cylinder, which releases gas when the cylinder valve is opened. The semiconductor industry has used SAGDS successfully for ten years.

Importantly, this definition allows the use of all technologies currently available as SAGDS. Each type of SAGS technologies has risks and benefits; however, they all have a significant benefit over typical gas cylinders, which is subatmospheric delivery. All types SAGS can contain HPM's and need to be treated as such.

Further, this definition captures the practical need for SAGDS to deliver gas below atmospheric pressure under the range of normal operating conditions that would be encountered in a fab use environment.

SAGDS technology is designed such that there is little to no gas release under upset conditions (i.e. line break). For this reason lower ventilation rates are acceptable and prescribed values are not appropriate. Instead of using a one case fits all approach to ventilation, the requirement is performance based. This proposal requires that the ventilation needed to maintain safe conditions be calculated for each type of SAGDS. The method used to do the calculations has to be approved by the fire code official. With the exception of this modification, the safety requirements for SAGDS are the same as for HPM gases.

Item 2 – These changes eliminate a conflict in Chapter 37 that would be created by adopting Part 2. They refer the code user back to Chapter 18 to determine exhaust requirements for SAGDS.

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

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that it was being asked to referee an industry disagreement on a subject about which the committee has very little information. SAGS appears to be a technology on which the industry cannot even agree and has not been able to develop an adequate referenced standard. A concern was also expressed that the pressure reduction

devices are not listed or labeled by a nationally recognized testing laboratory. In dealing with highly corrosive, highly toxic materials, there is no information as to system reliability. SAGS cylinders are currently allowed by the code as any other gas cylinder, so there is no prohibition involved in the current text. The testimony presented consisted of opposing industry view points with no significant testimony from the fire service and it was suggested that a broad consensus be sought on this topic before bringing the proposal back again.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Ron Fuhrhop, Praxair, Inc., requests Approval as Submitted.

Commenter's Reason: The same reason as stated in the original proposed change F220, submitted by Ron Fuhrhop.

Final Action: AS AM AMPC____ D

F221-07/08
1803.16 through 1803.16.5 (New), 1802.1 (New)

Proposed Change as Submitted:

Proponent: Jim McManus, Advanced Technology Materials, Inc. (ATMI, Inc.), representing ATMI, Inc. and Matheson Tri-Gas, Inc.

1. Add new text as follows:

1803.16 Sub-atmospheric gas systems (SAGS). General safety provisions specific to sub-atmospheric gas systems (SAGS) containing HPM gases shall be in accordance with Sections 1803.16.1 through 1803.16.5.

1803.16.1 Location. SAGS gas delivery systems shall not be restricted as to location in a fabrication area except as required by 1803.16.2.

1803.16.2 Exhausted enclosures. Storage or use of SAGS in a fabrication area shall be within exhausted enclosures of noncombustible construction. Ventilation inside the enclosure shall be not less than 50 cfm and shall be sufficient to maintain vapors within the enclosure below 25% of the lower flammable limit (LFL) and below immediately dangerous to life and health concentration (IDLH).

1803.16.2.1 Continuous gas detection. A continuous gas detection system shall be provided in exhausted enclosures containing SAGS in accordance with section 1803.13.

1803.16.3 Treatment systems. Treatment systems for Type 1 SAGS containing highly toxic and toxic gases are not required.

1803.16.4 Purge gas. Purge gas used for Type 1 SAGS gas delivery systems shall be allowed to be supplied from either a house system or from dedicated purge gas cylinders.

1803.16.5 Shut-off of gas supply. An automatic shutoff valve shall be installed to isolate a Type 2 SAG cylinder from the gas distribution system in the event the internal pressure reduction device of the SAG cylinder fails.

2. Add new definitions as follows:

1802.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this Code, have the meanings shown herein.

SUB-ATMOSPHERIC GAS SYTEMS (SAGS). Sub-atmospheric gas system types are as follows:

TYPE 1: SUB-ATMOSPHERIC GAS STORAGE AND DELIVERY SYSTEM. A gas source package that stores and delivers gas at sub-atmospheric pressure. The system includes a container (e.g. gas cylinder and outlet valve) that stores and delivers gas at a pressure of less than 14.7 psia at NTP.

TYPE 2: SUB-ATMOSPHERIC GAS DELIVERY SYSTEM. A gas source package that stores compressed gas and delivers gas sub-atmospherically. The system includes a container (e.g. gas cylinder and outlet valve) that stores gas at a pressure greater than 14.7 psia at NTP and delivers gas at a pressure of less than 14.7 psia at NTP.

Reason: SAGS are HPM gas storage and delivery systems that store and/or deliver gas at pressures below 0 psig. SAGS can be used in place of traditional compressed gas cylinders that normally store and operate at pressures as high as 2200 psig. The reduced pressure of the SAGS system decreases the risk of hazardous gas leakage when compared to compressed gas cylinders. Since the hazards of SAGS are different than compressed gases, specific classification and installation requirements are necessary in the code. SAGS have been in use since 1994 by semiconductor manufacturing companies and have significantly improved the efficiency and safety of modern wafer fabrication operations. The proposed code change provides new language that properly defines the types of SAGS in use and lists general safety provisions for use of these systems consistent with best practices developed by the semiconductor industry.

There are two types of SAGS systems as follows:

Type 1 SAGS include a container and outlet valve containing gas in a chemically or physically altered state which removes the pressure normally associated with the gas. The material (e.g. phosphine gas) is stored sub-atmospherically (< 14.7 psia). Whereas a standard compressed gas cylinder containing phosphine gas would normally be at a pressure of 590 psig in a liquefied state. The Type 1 SAGS has changed the physical state of the gas to that of one more like a solid. By removing the pressure normally associated with the gas, the risk of a hazardous gas release during storage or use is significantly reduced. Gas is dispensed from the cylinder by applying vacuum to the cylinder valve outlet.

Type 2 SAGS are compressed gas containers containing compressed gas under pressure, with an integral mechanical device (e.g. regulator) that reduces the pressure at the cylinder valve outlet to less than 14.7 psia. As a standard compressed gas cylinder containing phosphine gas would normally be at a pressure of 590 psig in a liquefied state, the Type 2 SAGS would also exhibit the same 590 psig internal pressure. However, by reducing the pressure at the cylinder valve outlet the risk of a hazardous gas release during delivery to process equipment is significantly reduced. Gas is dispensed from the cylinder by applying vacuum to the cylinder valve outlet.

Specific justifications for the new general safety provisions are as follows:

1803.16.1 – The current code specifies the location for HPM gases in a semiconductor fabrication area to comply with section 1804.2.1 and 1805.2.1. The inherent safety of SAGS when compared to compressed gases has allowed users of these systems to specify locations with less restrictive requirements than 1804.2.1 and 1805.2.1. By assuring exclusion of SAGS from the requirements of 1804.2.1 and 1805.2.1, and inclusion of 1803.16.2, the code becomes consistent with how SAGS are used.

1803.16.2 – Specifies the requirement of exhausted enclosures for SAGS systems consistent with prudent usage.

1803.16.3 – Low gas release rates for SAGS Type 1 cylinders justify the avoidance of treatment systems.

1803.16.4 – Since SAG Type 1 systems do not pressurize the gas distribution system the risk of contaminating the house purge gas supply is reduced to an acceptable level.

1803.16.5 – Defines a safety requirement designed to mitigate the hazard associated with failure of the internal pressure reducing device within the SAG Type 2 cylinder. If the SAG Type 2 pressure reducing device fails, the gas distribution system could be exposed to full cylinder pressure potentially causing system component failure resulting in a gas release. Since the failure of a mechanical pressure reducing device such as a regulator is not uncommon this requirement seems prudent. This method of protection is normally implemented in gas distribution systems utilizing SAGS Type 2 systems and should become a standard requirement to assure safe usage.

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

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved for the same reasons as F220-07/08. It was also observed that NFPA 318 does not address the types of systems in this proposal and to approve F221-07/08 could set up a competing standard for the systems.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Jim McManus, ATMI, Inc., requests Approval as Modified by this public comment.

Modify proposal as follows:

1803.16.2 Gas cabinets and ~~E~~exhausted enclosures. Storage or use of SAGS in a fabrication area shall be within gas cabinets or in exhausted enclosures of noncombustible construction. Ventilation ~~inside~~ in the enclosure or gas cabinet ~~shall be not less than 50 cfm and~~ shall be sufficient to maintain vapors ~~within the enclosure~~ below 25% of the lower flammable limit (LFL) and below immediately dangerous to life and health concentration (IDLH).

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The proposal contains definitions for sub-atmospheric "pressure" gas systems [SAGS] identical to those recently ratified at the NFPA Association Technical Meeting in June 2008. With respect to the Committee's concerns voiced at the Palm Springs meeting, we believe the Fire Safety Community made strong strides in achieving consensus in how to classify SAGS. The two-tier definition, championed by the NFPA 318 technical committee, is based on the relative risk profiles posed by the Type 1 and Type 2 SAGS. It also provides the framework to classify a compressed gas as a SAGS by including it as a Type 2 category. The proposed modification includes general safety provisions for SAGS systems that are consistent with the definitions and associated hazards.

NTP = Normal Temperature and Pressure as defined in Chapter 27 of the IFC.

Final Action: AS AM AMPC____ D

F227-07/08

2205.1, 2206.2, 2206.2.2, 2206.2.3, 2206.2.5, 2206.6.2, 2206.7.6, 2206.7.6.1, Table 2206.2.3

Proposed Change as Submitted:

Proponent: Lynne M. Kilpatrick, Fire Department, Seattle, WA, representing Washington State Association of Fire Marshals

Revise as follows:

2205.1 Tank filling operations for Class I, II or ~~IIIA~~ III liquids. Delivery operations to tanks for Class I, II or ~~IIIA~~ III liquids shall comply with Sections 2205.1.1 through 2205.1.3 and the applicable requirements of Chapter 34.

2206.2 Method of storage. Approved methods of storage for Class I, II and ~~IIIA~~ III liquid fuels at motor fuel-dispensing facilities shall be in accordance with Sections 2206.2.1 through 2206.2.5.

2206.2.2 Above-ground tanks located inside buildings. Above-ground tanks for the storage of Class I, II and ~~IIIA~~ IIII iquid fuels are allowed to be located in buildings. Such tanks shall be located in special enclosures complying with Section 2206.2.6, in a liquid storage room or a liquid storage warehouse complying with Chapter 34, or shall be listed and labeled as protected above-ground tanks.

2206.2.3 Above-ground tanks located outside, above grade. Above-ground tanks shall not be used for the storage of Class I, II or ~~IIIA~~ III liquid motor fuels except as provided by this section.

1. Above-ground tanks used for outside, above-grade storage of Class I liquids shall be listed and labeled as protected above-ground tanks and shall be in accordance with Chapter 34. Such tanks shall be located in accordance with Table 2206.2.3.
2. Above-ground tanks used for outside, above-grade storage of Class II or IIIA liquids ~~are allowed to~~ shall be listed and labeled as protected above-ground tanks and shall be in accordance ~~or, when approved by the fire code official, other above-ground tanks that comply~~ with Chapter 34. Tank locations shall be in accordance with Table 2206.2.3.

   Exception: Where approved by the fire code official, other aboveground tanks that comply with Chapter 34 shall be allowed.

3. Tanks containing fuels shall not exceed 12,000 gallons (45 420 L) in individual capacity or 48,000 gallons (181 680 L) in aggregate capacity. Installations with the maximum allowable aggregate capacity shall be separated from other such installations by not less than 100 feet (30 480 mm).
4. Tanks located at farms, construction projects, or rural areas shall comply with Section 3406.2.
5. Above-ground tanks used for outside above-grade storage of Class IIIB liquid motor fuels shall be listed and labeled in accordance with UL 142 or listed and labeled as protected aboveground tanks in accordance with UL 2085 and shall be installed in accordance with Chapter 34. Tank locations shall be in accordance with Table 2206.2.3.

2206.2.5 Portable tanks. Where approved by the fire code official, portable tanks are allowed to be temporarily used in conjunction with the dispensing of Class I, II or ~~IIIA~~ III liquids into the fuel tanks of motor vehicles or motorized equipment on premises not normally accessible to the public. The approval shall include a definite time limit.

2206.6.2 Piping, valves, fittings and ancillary equipment for above-ground tanks for Class I, II and ~~IIIA~~ IIII liquids. Piping, valves, fittings and ancillary equipment for above-ground tanks shall comply with Sections 2206.6.2.1 through 2206.6.2.6.

2206.7.6 Fuel delivery nozzles. A listed automatic-closing- type hose nozzle valve with or without a latch-open device shall be provided on island-type dispensers used for dispensing Class I, II or ~~IIIA~~ III liquids. Overhead-type dispensing units shall be provided with a listed automatic-closing-type hose nozzle valve without a latch-open device.

Exception: A listed automatic-closing-type hose nozzle valve with latch-open device is allowed to be used on overhead-type dispensing units where the design of the system is such that the hose nozzle valve will close automatically in the event the valve is released from a fill opening or upon impact with a driveway.

2206.7.6.1 Special requirements for nozzles. Where dispensing of Class I, II or ~~IIIA~~ III liquids is performed, a listed automatic-closing-type hose nozzle valve shall be used incorporating all of the following features:

1. The hose nozzle valve shall be equipped with an integral latch-open device.
2. When the flow of product is normally controlled by devices or equipment other than the hose nozzle valve, the hose nozzle valve shall not be capable of being opened unless the delivery hose is pressurized. If pressure to the hose is lost, the nozzle shall close automatically.

   Exception: Vapor recovery nozzles incorporating insertion interlock devices designed to achieve shutoff on disconnect from the vehicle fill pipe.

3. The hose nozzle shall be designed such that the nozzle is retained in the fill pipe during the filling operation.
4. The system shall include listed equipment with a feature that causes or requires the closing of the hose nozzle valve before the product flow can be resumed or before the hose nozzle valve can be replaced in its normal position in the dispenser.

TABLE 2206.2.3
MINIMUM SEPARATION REQUIREMENTS FOR ABOVE-GROUND TANKS

CLASS OF LIQUID AND TANK TYPE	INDIVIDUAL TANK CAPACITY (gallons)	MINIMUM DISTANCE FROM NEAREST IMPORTANT BUILDING ON SAME PROPERTY (feet)	MINIMUM DISTANCE FROM NEAREST FUEL DISPENSER (feet)	MINIMUM DISTANCE FROM LOT LINE THAT IS OR CAN BE BUILT UPON, INCLUDING THE OPPOSITE SIDE OF A PUBLIC WAY (feet)	MINIMUM DISTANCE FROM NEAREST SIDE OF ANY PUBLIC WAY (feet)	MINIMUM DISTANCE BETWEEN TANKS (feet)
Class I protected above-ground tanks	Less than or equal	5	25[a]	15	5	3
	Greater than 6,000	15	25[a]	25	15	3
Class II and III protected above-ground tanks	Same as Class I	Same as Class I	Same as Class I[c]	Same as Class I	Same as Class I	Same as Class I
Tanks in vaults	0-20,000	0[b]	0	0 [b]	0	Separate compartment required for each
Other tanks	All	50	50	100	50	3

a. At fleet vehicle motor fuel-dispensing facilities, no minimum separation distance is required.
b. Underground vaults shall be located such that they will not be subject to loading from nearby structures, or they shall be designed to accommodate applied loads from existing or future structures that can be built nearby.
c. For Class IIIB liquids in protected above-ground tanks, no minimum separation distance is required.

Reason: An increasing number of facilities are establishing motor vehicle fuel-dispensing stations for dispensing B100/B99 bio-diesel, a Class IIIB liquid, into motor vehicles. In many cases these fueling stations are not set up as traditional gas stations but rather they consist of a small stand alone fuel dispensing operation using a 500-3,000 gallon fuel tank located near a drive-through espresso stand or mini market. Chapter 22 has only minimal requirements for the installation of tanks and fueling operations for dispensing Class IIIB liquids into motor vehicles and it does not adequately address the potential hazards associated with this increasing trend. This proposal will add the following new requirements for dispensing Class IIIB liquids into motor vehicles:

1. tanks for dispensing Class IIIB liquids into the fuel tanks of motor vehicles will need to be listed to UL 142 or UL 2085 to eliminate the common practice of dispensing directly from plastic Intermediate Bulk Container (IBC) totes,
2. the driver or operator of the fuel delivery vehicle will be required to gauge the tank to determine how much fuel is needed before filling the tank,
3. an approved method of storage will have to be provided for the Class IIIB fuel in accordance with the MAQ allowed in Chapter 27 for storage in a single control area (13,200 gallons in an unsprinklered building and unlimited in a sprinklered building) when dispensing from tanks located inside buildings,
4. fueling Class IIIB liquids into motor vehicles from portable tanks will only be allowed on a temporary basis,
5. piping, valves, fittings and ancillary equipment will need to comply with the same requirements that currently apply to Class I, II and IIIA liquid fuel dispensing operations, including but not limited to, proper tank fill openings and connections, approved method to prevent overfilling and anti-siphon systems, and
6. fuel delivery nozzles will be required to be the listed automatic-closing type.

Table 2206.2.3, which appears to already regulate Class IIIB liquids even though the corresponding Section 2206.2.3 makes reference only to Class II and IIIA liquids, has also been modified by adding a new footnote c. The footnote is added to eliminate the 50 foot separation that is required between protected (UL 2085) tanks containing Class IIIB liquids and the fuel dispenser. Note that even with this change Class IIIB liquids in non-protected tanks (UL 142) will be required to comply with Table 2206.2.3 requirements for "other tanks" which still requires a 50 foot separation between that tank and the dispenser.

We believe that these proposed changes provide for prudent controls for Class IIIB tank systems at motor vehicle fueling stations which currently are largely unregulated.

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

Committee Action: Disapproved

Committee Reason: The proposal was disapproved because the committee felt that, while it has merit and the biodiesel issue needs to be addressed, the revision to Section 2206.2.3, Item 2 would result in a lesser standard of safety for Class I, II and III than that in item 5 and there needs to be clarification of the differences between the classes of liquids versus liquid fuels.

Assembly Action: None

Individual Consideration Agenda

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

Public Comment 1:

Bob Eugene, Underwriters Laboratories, Inc., requests Approval as Modified by this public comment.

Modify proposal as follows:

2206.2.3 Above-ground tanks located outside, above grade. Above-ground tanks shall not be used for the storage of Class I, II or III liquid motor fuels except as provided by this section.

1. Above-ground steel tanks used for above-grade storage of Class I liquids shall be listed and labeled as protected above-ground tanks and shall be in accordance with Chapter 34. Such tanks shall be located in accordance with Table 2206.2.3.
2. Above-ground tanks used for outside, above-grade storage of Class II or ~~IIIA~~ III liquids shall be listed and labeled as protected above-ground tanks and shall be in accordance with Chapter 34. Tank locations shall be in accordance with Table 2206.2.3.

   Exception: Where approved by the fire code official, other aboveground tanks that comply with Chapter 34 shall be allowed.

3. Tanks containing fuels shall not exceed 12,000 gallons (45 420 L) in individual capacity or 48,000 gallons (181 680 L) in aggregate capacity. Installations with the maximum allowable aggregate capacity shall be separated from other such installations by not less than 100 feet (30 480 mm).
4. Tanks located at farms, construction projects, or rural areas shall comply with Section 3406.2.
5. ~~Above-ground tanks used for outside above-grade storage of Class IIIB liquid motor fuels shall be listed and labeled in accordance with UL 142 or listed and labeled as protected aboveground tanks in accordance with UL 2085 and shall be installed in accordance with Chapter 34. Tank locations shall be in accordance with Table 2206.2.3.~~

(Portions of proposal not shown remain unchanged)

Commenter's Reason: In addition to the Proposal and reason statement of the original proponent, this Comment will add the following new requirements for dispensing Class IIIB liquids into motor vehicles:

1. Tanks for dispensing Class I liquids into the fuel tanks of motor vehicles will need to be listed and adds "steel" to the tanks referenced in Section 2206.2.3 items 1
2. Section 2206.2.3 Item 2 is broadened to include all Class II, IIIA and IIIB liquids.
3. Section 2206.2.3 Item 5 is deleted because Class IIIB liquids were added to Item 2.

We believe that these proposed changes provide for prudent controls for Class IIIB tank systems at motor vehicle fueling stations, which currently are largely unregulated, and fully respond to the Committee concerns.

Public Comment 2:

Lynne M. Kilpatrick, City of Seattle Fire Department, representing Washington State Association of Fire Marshals, requests Approval as Modified by this public comment.

Modify proposal as follows:

2206.2 Method of storage. Approved methods of storage for Class I, II and III liquids ~~fuels~~ at motor fuel-dispensing facilities shall be in accordance with Sections 2206.2.1 through 2206.2.5.

2206.2.2 Above-ground tanks located inside buildings. Above-ground tanks for the storage of Class I, II and III liquids ~~fuels~~ are allowed to be located in buildings. Such tanks shall be located in special enclosures complying with Section 2206.2.6, in a liquid storage room or a liquid storage warehouse complying with Chapter 34, or shall be listed and labeled as protected above-ground tanks.

2206.2.3 Above-ground tanks located outside, above grade. Above-ground tanks shall not be used for the storage of Class I, II or III liquids ~~motor fuels~~ except as provided by this section.

1. Above-ground tanks used for outside, above-grade storage of Class I liquids shall be listed and labeled as protected above-ground tanks and shall be in accordance with Chapter 34. Such tanks shall be located in accordance with Table 2206.2.3.
2. Above-ground tanks used for outside, above-grade storage of Class II or IIIA liquids shall be listed and labeled as protected aboveground tanks and shall be in accordance with UL 2085 and shall be installed in accordance with Chapter 34. Tank locations shall be in accordance with Table 2206.2.3.

   Exception: Where approved by the fire code official, ~~other aboveground tanks that comply with Chapter 34 shall be allowed~~ tanks listed and labeled in accordance with UL 142 shall be allowed.

~~5.~~ 3. Above-ground tanks used for outside above-grade storage of Class IIIB liquids shall be listed and labeled in accordance with UL 142, Standard for Steel Aboveground Tanks, or listed and labeled as protected aboveground tanks in accordance with UL 2085, Protected Aboveground Tanks for Flammable and Combustible Liquids, and shall be installed in accordance with Chapter 34. Tank locations shall be in accordance with Table 2206.2.3.

~~3~~. 4. Tanks containing ~~fuels~~ Class I, II or III liquids shall not exceed 12,000 gallons (45 420 L) in individual capacity or 48,000 gallons (181 680 L) in aggregate capacity. Installations with the maximum allowable aggregate capacity shall be separated from other such installations by not less than 100 feet (30 480 mm).

~~4~~ 5. Tanks located at farms, construction projects, or rural areas shall comply with Section 3406.2.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This proposal has been modified to address the Committee's concerns. Throughout each of the sections the term "liquid fuels" has been removed and in its place the phrase "Class I, II and III liquids" has been inserted. The use of "Class I, II and III liquids" is consistent with terminology used throughout the code and today there are motor vehicle fuels that fall into each of the three hazard classifications.

A modification was made to Item 2 to address the Committee's concern that the provisions of Item 2 would result in a lesser standard of safety for Class II and IIIA liquids than that for Class IIIB liquids in Item 3. Item 2 requires a protected aboveground tank but allows the fire code official to accept a steel aboveground tank where it is deemed appropriate. This is consistent with what the current code allows although the provision was restructured. Item 3 allows the user to determine whether a protected aboveground tank or a steel aboveground tank will be provided. This does not result in a lesser safety standard for Class II and IIIA liquids but gives some discretion to the fire code official regarding the need for the protected aboveground tank in all applications. The important aspect of the new Item 3 is to mandate that one of these two tank types specified is required for dispensing Class IIIB liquids at motor vehicle fueling stations since the industry trend has been to use a poly-type tank or intermediate bulk container (IBC).

Public Comment 3:

Ben Pascal, Propel Biofuels, Inc., representing The Biodiesel Industry, requests Approval as Modified by this public comment.

Modify proposal as follows:

TABLE 2206.2.3
MINIMUM SEPARATION REQUIREMENTS FOR ABOVE-GROUND TANKS

CLASS OF LIQUID AND TANK	INDIVIDUAL TANK CAPACITY (gallons)	MINIMUM DISTANCE FROM NEAREST IMPORTANT BUILDING ON SAME PROPERTY	MINIMUM DISTANCE FROM NEAREST FUEL DISPENSER (feet)	MINIMUM DISTANCE FROM LOT LINE THAT IS OR CAN BE BUILT UPON, INCLUDING THE OPPOSITE SIDE	MINIMUM DISTANCE FROM NEAREST SIDE OF ANY PUBLIC WAY (feet)	MINIMUM DISTANCE BETWEEN TANKS (feet)
Class I protected above-ground tanks	Less than or equal to 6,000	5	25[a]	15	5	3
	Greater than 6,000	15	25[a]	25	15	3
Class II and III protected above-ground tanks	Same as Class I	Same as Class I	~~Same as Class I~~[c] 0	Same as Class I	Same as Class I	Same as Class I
Tanks in vaults	0-20,000	0[b]	0	0[b]	0	Separate compartment required for each tank
Other tanks	All	50	50	100	50	3

a. At fleet vehicle motor fuel-dispensing facilities, no minimum separation distance is required.
b. Underground vaults shall be located such that they will not be subject to loading from nearby structures, or they shall be designed to accommodate applied loads from existing or future structures that can be built nearby.
~~c. For Class IIIB liquids in protected above-ground tanks, no minimum separation distance is required.~~

(Portions of proposal not shown remain unchanged)

Commenter's Reason: Although I am in favor of Lynne Kilpatrick's proposal for no minimum separation distance between tank and dispenser for Class IIIB liquids for the benefit of B99 biodiesel retailers, I would like to propose an amendment that further encompasses other blends of biodiesel. The current 25' separation between the tank and dispenser makes it extremely difficult (if not impossible) for biodiesel companies who build a biodiesel dispensing facility in the corner of an existing gas station to offer lower blends of biodiesel since B5, B20 and B50 biodiesel fall under either a Class II or IIIA liquid (depending on the petroleum diesel used for blending). Sites typically do not have enough space to allow for a 25' separation. These lower blends of biodiesel are more economical than B99 & B100 and still provide environmental benefits and are in line with the nation's energy plan to increase alternative fuel consumption in order for our nation to be more independent from foreign oil and to assist in the fight against global warming.

The 25' separation requirement between the dispenser and Class II & IIIA biodiesel in protected above-ground tanks (UL 2085) is unnecessary given the new tank technology out on the market today. Our research into the history of the 25' separation requirement shows that it was originally created prior to double-wall tank technology entering the industry market in the early 1990s and also prior to biodiesel entering the market. The dispenser/tank separation was established for the purpose of limiting the impact of a fire/spill at the dispenser from causing a pool fire at the tank which could result in failure of the tank. Because a UL 2085 tank has the ability to withstand a pool fire for at least a two hour period before failing (sometimes much longer than that), it seems acceptable to have zero separation between the tank and dispenser. The two-hour minimum failure time would give time for proper response to a fire at the dispenser and/or tank should one unlikely occur with biodiesel.

The risk factors for Class II and IIIA biodiesel are unlike Class I fuels in that static related and other fires initiated during the fuel dispensing activity are predominant to Class I fuels such as gasoline, but not diesel or biodiesel. It is worth noting that Table 2206.2.3 includes a footnote that waives the 25' separation requirement for motor fuel-dispensing facilities serving Class I liquids. Although it is argued that people fueling at private motor fuel-dispensing facilities are more highly trained than the average citizen who has been fueling their car for years, the inherent dangers must not be that bad if a zero separation is allowed for Class I liquids at motor fuel-dispensing facilities. We are simply asking for the same standard for Class II and IIIA liquids at public biodiesel fuel locations.

In conclusion, given the low combustibility of Class II and IIIA biodiesel in addition to the state-of-the-art technology of a UL 2085 above-ground tank, we believe a zero-foot separation requirement is acceptable between the tank and dispenser. This will greatly enhance the opportunities for biodiesel companies to make a difference for our country and the environment. Thank you.

Final Action: AS AM AMPC____ D

F229-07/08
2206.2.2

Proposed Change as Submitted:

Proponent: Lynne M. Kilpatrick, Fire Department, Seattle, WA, representing Washington State Association of Fire Marshals

Revise as follows:

2206.2.2 Above-ground tanks located inside buildings. Above-ground tanks for the storage of Class I, II and IIIA liquid fuels are allowed to be located in buildings. Such tanks shall be located in special enclosures complying with Section 2206.2.6, or in a liquid storage room or a liquid storage warehouse complying with Chapter 34~~, or shall be listed and labeled as protected above-ground tanks~~.

Exceptions:

1. Protected aboveground tanks storing Class I liquids, having an aggregate capacity not exceeding 1,500 gallons (454 L) and located in a room or rooms protected by an automatic sprinkler system complying with Section 903.3.1.1 are not required to be located in a special enclosure, liquid storage room or warehouse.
2. Protected aboveground tanks storing Class II or IIIA liquids, having an aggregate capacity not exceeding 3,000 gallons (908 L) and located in a room or rooms protected by an approved automatic sprinkler system complying with Section 903.3.1.1 are not required to be located in a special enclosure, liquid storage room or warehouse.
3. Aboveground tanks storing Class IIIB liquids in quantities not greater than the maximum allowable quantity per control area indicated in Table 2703.1.1(1).

Reason: Currently Section 2206.2.2 appears to allow an unlimited quantity of Class I, II and IIIA liquids inside buildings for fueling motor vehicles as long as the fuel is stored in a protected aboveground tank listed to UL 2085. This proposal establishes reasonable limits for the aggregate quantity of fuel in protected aboveground tanks that can be installed inside buildings for fueling motor vehicles. The 3,000 gallon limit proposed for Class II and IIIA liquids in Exception 2 is consistent with the maximum quantity currently allowed in Section 603.3 for protected tanks installed inside buildings supporting fuel-burning equipment. Exception 3 of the proposal defaults to the MAQ per control area set forth in Chapter 27 for Class IIIB liquids which effectively allows for 13,200 gallons per control area in unsprinklered buildings and an unlimited quantity in sprinklered buildings. Since there is no code precedent for limiting Class I flammable liquids in protected aboveground tanks inside buildings Exception 1 of the proposal establishes a limit of 1,500 gallons. It is necessary to approve this code change in order to establish some quantity limits for flammable and combustible liquids in protected aboveground tanks installed inside buildings. Without this change, an unlimited quantity of Class I, II and IIIA liquids is allowed inside buildings in protected tanks located outside of a liquid storage room.

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

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the requirement that protected aboveground tanks be listed and labeled is being removed and that there is no technical basis for the proposal. In addition, Exception 3 does not refer to protected aboveground tank as do Exceptions 1 and 2. The proposal would also treat protected aboveground tanks differently than special enclosures when the development of protected aboveground tanks was specifically directed at making them equivalent to special enclosures.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Lynne M. Kilpatrick, City of Seattle Fire Department, representing Washington State Association of Fire Marshals, requests Approval as Modified by this public comment.

Replace proposal as follows:

2206.2.2 Above-ground tanks located inside buildings. Above-ground tanks for the storage of Class I, II and IIIA liquid fuels are allowed to be located in buildings~~. Such tanks shall be~~ when located in special enclosures complying with Section 2206.2.6, or in a liquid storage room or a liquid storage warehouse complying with Chapter 34.

Exceptions:

1. Protected aboveground tanks storing Class II or IIIA combustible liquids having an aggregate capacity not exceeding 3,000 gallons (908 L) in a room or rooms protected by an approved automatic sprinkler system complying with Section 903.3.1.1 are not required to be located in a special enclosure, liquid storage room or liquid storage warehouse.
2. Class IIIB liquids in quantities below the maximum allowable quantities per control area set forth in Table 2703.1.1(1) when such liquids are stored in tanks listed and labeled in accordance with UL 142, Standard for Steel Aboveground Tanks, or listed and labeled as protected aboveground tanks in accordance with UL 2085, Protected Aboveground Tanks for Flammable and Combustible Liquids, and installed in accordance with Chapter 34.

Commenter's Reason: Contrary to the Committee comment, the proposal does not eliminate the requirement that protected tanks be listed and labeled. The current text allows for any one of four storage options for flammable or combustible liquids inside buildings at motor vehicle fueling stations. It allows for storage of flammable and combustible in 1) special enclosures, 2) liquid storage rooms (Group H occupancy), 3) liquid storage warehouses (Group H occupancy), or 4) protected aboveground tanks. The Committee stated that protected aboveground tanks were developed specifically as an equivalency to special enclosures. The problem with all four options being equivalent is that in Chapter 34 and elsewhere in the Code protected aboveground tanks are still required to be confined to a Group H occupancy once the MAQ is exceeded, or in the case of protected aboveground tanks containing Class II liquids (diesel) and connected to generators, quantities over 3,000 gallons are required to be confined to a Group H occupancy.

Exceptions 1 and 2 of the modified proposal simply align the requirement for when protected aboveground tanks containing Class II and III liquids inside buildings must be further confined in a Group H occupancy with Chapter 34 requirements.

Exception 1 of the original proposal was deleted since it introduced a new concept allowing Class I flammable liquids in protected aboveground tanks over the MAQ found in Chapter 27. The modified proposal here does not provide any exception for Class I liquids which means that any quantity of Class I liquid over the MAQ is required to be confined to a Group H occupancy or special enclosure regardless of whether it is stored in a protected aboveground tank or a steel aboveground tank.

Exception 3 of the original proposal (Exception 2 in the modified proposal) does not mandate confining motor vehicle fuels classified as Class IIIB liquids to a protected aboveground tank or to a special enclosure or to a liquid storage room or warehouse (Group H occupancy) since they are not required elsewhere in the Code when stored in quantities below the MAQ.

Approval of this modified proposal will provide consistency for the storage of flammable and combustible liquids inside buildings at motor vehicle fueling stations with other Chapters in the Code.

Final Action: AS AM AMPC____ D

F231-07/08
2209.2.1

Proposed Change as Submitted:

Proponent: Robert J. Davidson, Davidson Code Concepts, LLC, representing himself

Revise as follows:

2209.2.1 Approved equipment. Cylinders, containers and tanks; pressure relief devices, including pressure valves; hydrogen vaporizers; pressure regulators; and piping used for gaseous hydrogen systems shall be designed and constructed in accordance with ~~Section 3003, 3203 or NFPA 55~~ Chapters 30 and 32.

Reason: The use of the term "or" implies a choice of which section of the IFC to comply with and a choice to not comply with either section of the IFC and to comply with NFPA 55 instead. This causes difficulty in applying the requirements, which one do you choose? Is it the regulators choice or that of the designer?

The implied choice also creates a conflict with other sections of the fire code such as Section 3201.1 which requires compliance with Chapter 32 and NFPA 55.

Changing the language to refer to Chapters 30 and 32 maintains the requirements and eliminates the confusion. Both Chapter 32 as now referenced and Chapter 35 which is referenced in Section 220.1 have a reference to NFPA 55, so the application of that standard is maintained. This proposed change correlates the section with the manner in which the code applies, i.e., comply with the requirements of the code and the referenced standard.

The need for this clarification was identified during a "Hydrogen Fueling Station Permitting Workshop" held on July 10, 2007 that was co-sponsored by the United States Department of Energy and the National Association of State Fire Marshals. Building and fire code officials participating in the workshop believe the use of the "or" created confusion in applying the code section.

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

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that it would not improve the code and that the current text is adequate. The current text only references equipment and only needs to reference other sections that deal with equipment.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Robert J. Davidson, Davidson Code Concepts, LLC, representing Plug Power, Inc., requests Approval as Modified by this public comment.

Replace proposal as follows:

2209.2.1 Approved equipment. Cylinders, containers and tanks; pressure relief devices, including pressure valves; hydrogen vaporizers; pressure regulators; and piping used for gaseous hydrogen systems shall be designed and constructed in accordance with Sections 3003~~,~~ and 3203 ~~or~~ and NFPA 55.

Commenter's Reason: The committee's main objection to the initial code proposal was that the suggested change did not focus on equipment as the current code language does. What wasn't addressed was the use of the term "or" instead of the term "and". The use of the term "or" implies a choice of which section of the IFC to comply with and a choice to not comply with either section of the IFC and to comply with NFPA 55 instead. This causes difficulty in applying the requirements, which one do you choose? Is it the regulators choice or that of the designer? The intent of the code was that all three references be complied with as applicable.

The proposed modification simply changes the word "or" to the word "and". This will clarify that you apply the referenced fire code sections and NFPA 55, not one or the other and maintains the specific references that the committee preferred.

Final Action: AS AM AMPC____ D

F233-07/08, Part II
IBC 406.5.2, Chapter 35 (New)

THIS CODE CHANGE WILL BE HEARD ON THE IBC GENERAL PORTION OF THE HEARING ORDER.

NOTE: PART I DID NOT RECEIVE A PUBLIC COMMENT AND IS ON THE CONSENT AGENDA. PART I IS REPRODUCED FOR INFORMATIONAL PURPOSES ONLY FOLLOWING ALL OF PART II.

Proposed Change as Submitted:

Proponent: Joseph, Chair, Hydrogen Industry Panel on Codes (HIPOC)

PART II – IBC GENERAL

406.5.2 (Supp) Vehicle fueling pad. The vehicle ~~fueling pad~~ shall be fueled on non-coated ~~of~~ concrete or ~~a~~ other approved paving material having a ~~resistivity~~ resistance not exceeding 1 megohm as determined by ~~an approved method~~ the methodology specified in DIN EN 1081.

2. Add standard to Chapter 35 as follows:

European Committee for Standardization (EN)
Central Secretariat
Rue de Stassart 36
B-10 50 Brussels

European Standard EN 1081: 1998 Resilient Floor Coverings – Determination of the Electrical Resistance

Reason: The proposed changes retain the original intent of this section while correcting some incorrect language and providing additional guidance for the code official. These changes address concerns voiced by ICC members during the last code cycle regarding the specified units and the request for additional guidance for the code official by using a referenced standard.

Units: Megohms are the appropriate measurement of resistance, not resistivity.

Referenced Standard: The referenced EN standard 1081:1998, which now has DIN status, is the best available standard that is applicable to measuring resistance of vehicle fueling pads. With this change the official still has the option to use another approved method, but DIN EN 1081:1998 is the referred method for measurement if non-coated concrete is not used. It may be worth noting that DIN EN 1081:1998 was created using an open, transparent and consensus-based process similar to the procedures used by ANSI-approved standard development organizations. Considering Standard 1081 also bares the EN designation, the U.S. building regulatory community should be comfortable that it has been, and will continue to be, carefully scrutinized and representative of the work of a true consensus body that we Americans are familiar with.

These proposed changes will retain the original intent of this section to dissipate static electricity built up on the vehicle from driving before the driver's door is opened--with corrected language and better guidance. The overall goal is to increase the safety of vehicle fueling. Concrete is allowed for the fueling pad with no resistance measurements needed; if an alternate material is desired, it can be used as long as it has a resistance less than or equal to 1 megohm. Both the concrete and 1 megohm criteria are cited from the American Petroleum Institute (API) 2003 Recommended Practices (RP), section 4.6.9.2. NFPA 77: *Recommended Practice on Static Electricity,* section 7.4.1.3 also points out that a resistance of 1 megohm or less is considered adequate to dissipate any charges. Additionally, the proposed language has been proposed by the State of Michigan, Department of Environmental Quality – Waste and Hazardous Materials Division for Michigan's *Hydrogen Storage and Dispensing Rules*, and is consistent with changes proposed under the current cycle to NFPA 55-2005, *Standard for the Storage, Use, and Handling of Compressed Gasses and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks*.
Cost Impact: The code change proposal will increase the cost of construction.

PART II – IBC GENERAL
Committee Action: **Disapproved**

Committee Reason: The committee did not receive enough data to determine the applicability of the requirements.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Thomas Joseph, Chair, Hydrogen Industry Panel on Codes, requests Approval as Submitted.

Commenter's Reason: The Hydrogen Industry asks the Membership to uphold IFC Committee Action on Part I for "As Submitted" and reverse IBC General Committee Action on Part II from "Disapprove" to "As Submitted" for consistency and uniformity in enforcement.

Fifteen (15) copies of the European Standard DIN EN 1081:1998-04, proposing electrostatic discharge (ESD) material and testing requirements for vehicle fueling surfaces were purchased and provided to the IFC Secretariat and Code Development Committee. The Secretariat's analysis indicated DIN EN 1081 was reviewed for compliance with ICC policy and accepted as compliant. Part I was subsequently reviewed and approved by the IFC Development Committee.

Part II was disapproved by IBC General Development Committee, not on technical grounds, but based on (1) Not having received additional copies of the standard and (2) that the IFC Secretariat's review and acceptance of DIN EN 1081 had not been coordinated with the IBC-General Secretariat or the IBC General Committee.

Final Action: AS AM AMPC____ D

NOTE: PART I REPRODUCED FOR INFORMATIONAL PURPOSES ONLY – SEE ABOVE

2209.5.1.1, Chapter 45 (New

1. PART I – IFC

Revise as follows:

2209.5.1.1 (Supp) Vehicle fueling pad. The vehicle ~~fueling pad~~ shall be fueled on non-coated ~~of~~ concrete or ~~a~~ other approved paving material having a ~~resistivity~~ resistance not exceeding one megohm as determined by ~~an approved method~~ the methodology specified in DIN EN 1081.

2. Add standard to Chapter 45 as follows:

European Committee for Standardization (EN)
Central Secretariat
Rue de Stassart 36
B-10 50 Brussels

European Standard EN 1081: 1998 Resilient Floor Coverings – Determination of the Electrical Resistance

Reason: The proposed changes retain the original intent of this section while correcting some incorrect language and providing additional guidance for the code official. These changes address concerns voiced by ICC members during the last code cycle regarding the specified units and the request for additional guidance for the code official by using a referenced standard.

Units: Megohms are the appropriate measurement of resistance, not resistivity.

Referenced Standard: The referenced EN standard 1081:1998, which now has DIN status, is the best available standard that is applicable to measuring resistance of vehicle fueling pads. With this change the official still has the option to use another approved method, but DIN EN 1081:1998 is the referred method for measurement if non-coated concrete is not used. It may be worth noting that DIN EN 1081:1998 was created using an open, transparent and consensus-based process similar to the procedures used by ANSI-approved standard development organizations. Considering Standard 1081 also bares the EN designation, the U.S. building regulatory community should be comfortable that it has been, and will continue to be, carefully scrutinized and representative of the work of a true consensus body that we Americans are familiar with.

These proposed changes will retain the original intent of this section to dissipate static electricity built up on the vehicle from driving before the driver's door is opened--with corrected language and better guidance. The overall goal is to increase the safety of vehicle fueling. Concrete is allowed for the fueling pad with no resistance measurements needed; if an alternate material is desired, it can be used as long as it has a resistance less than or equal to 1 megohm. Both the concrete and 1 megohm criteria are cited from the American Petroleum Institute (API) 2003 Recommended Practices (RP), section 4.6.9.2. NFPA 77: *Recommended Practice on Static Electricity,* section 7.4.1.3 also points out that a resistance of 1 megohm or less is considered adequate to dissipate any charges. Additionally, the proposed language has been proposed by the State of Michigan, Department of Environmental Quality – Waste and Hazardous Materials Division for Michigan's *Hydrogen Storage and Dispensing Rules*, and is consistent with changes proposed

under the current cycle to NFPA 55-2005, *Standard for the Storage, Use, and Handling of Compressed Gasses and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks*.

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

PART I – IFC
Committee Action: **Approved as Submitted**

Committee Reason: The proposal was approved because the committee felt that the proponent had responded to the committees concerns regarding the way the standard is referenced. That concern was expressed in the committee action on code change F156-07/07 in the last cycle.

Assembly Action: **None**

F234-07/08

2209.5 through 2209.5.8 (New), 2202.1, 2209.3.2.3, 907.2.23 (New) [IBC [F] 907.2.23 (New)], 2703.2.9.1; IFGC [F] 706.2

Proposed Change as Submitted:

Proponent: Thomas Joseph, Chair, Hydrogen Industry Panel on Codes (HIPOC)

1. Add new text as follows:

2209.5 Indoor fast-fill hydrogen fuel-dispensing. Indoor fast-fill hydrogen fuel-dispensing shall be conducted by a qualified operator and in accordance with Sections 2209.5.1 through 2209.5.8, Chapters 30 and 35 and the *International Fuel Gas Code*.

2209.5.1 Location of ancillary equipment. Liquid storage, vaporization and gas storage equipment shall be located outdoors in accordance with Section 2209.3.2.1. Gas compression and processing equipment shall be listed or approved for indoor use or located outdoors in accordance with Section 2209.3.2.1.

2209.5.2 Safety precautions. In addition to the requirements of Section 2209.5 safety precautions shall be provided in accordance with Section 2209.6 for dispensing into motor vehicles at self-service hydrogen motor fuel dispensing facilities

2209.5.2.1 Fire alarm and detection system. An approved manual and automatic fire alarm system shall be installed in indoor fast-fill hydrogen fuel-dispensing areas in accordance with Sections 907.2 and 2209.5.7. Activation of the system shall shut down the dispenser, stop flow of gas into the room and where mechanical ventilation is provided, and activate the ventilation system.

2209.5.3 Ventilation. Ventilation systems for indoor fast-fill hydrogen fuel- dispensing shall be in accordance with the *International Mechanical Code,* the *International Fuel Gas Code* and Sections 2209.5.3.1 and 2209.5.3.2.

2209.5.3.1 Design. Indoor locations shall be ventilated utilizing air supply inlets and exhaust outlets arranged to provide uniform air movement to the extent practical. Inlets shall be uniformly arranged on exterior walls near floor level. Outlets shall be located at the high point of the room in exterior walls or the roof.

Exception: Specially engineered installations as allowed by the *International Fuel Gas Code.*

2209.5.3.1.1 Room ventilation rate. The ventilation rate provided to the room in which the fast-fill hydrogen fuel-dispensing area is located shall be not less than 1 cubic foot per minute per 12 cubic feet (0.00139 m^3/s m^3) of room volume.

Exception: Indoor fast-fill hydrogen fuel-dispensing areas exceeding the room volume but not the maximum fuel delivery mass per refueling event as depicted in Figure 2209.5.3.1.1 shall not require room ventilation beyond that required for the location in accordance with Section 703.1 of the *International Fuel Gas Code*.

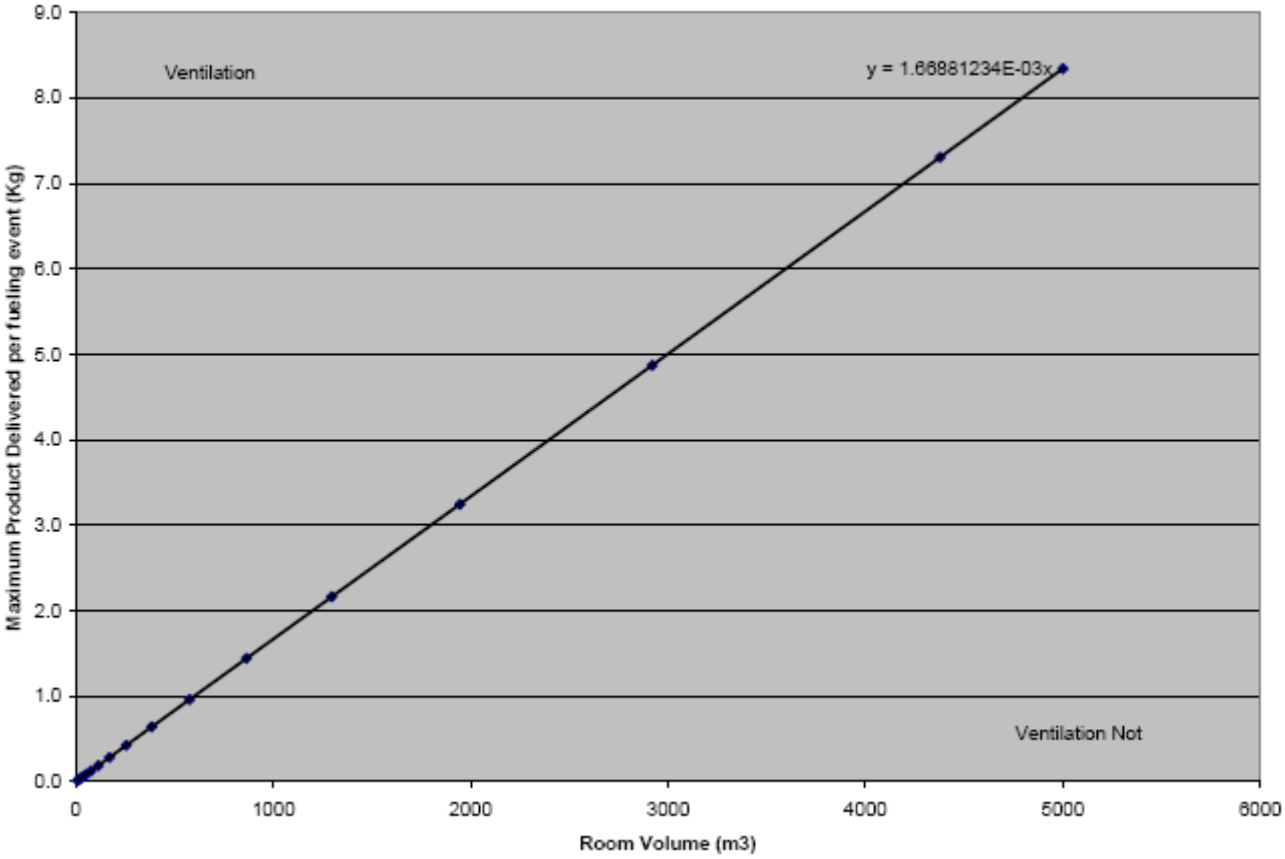


FIGURE 2209.5.3.1.1
INDOOR ATTENDED "FAST-FILL" HYDROGEN FUEL-DISPENSING LIMITATIONS

2209.5.3.1.2 Dedicated dispensing area ventilation rate. The ventilation system serving the dispensing area shall be at least 1 cubic foot per minute (0.00047 m^3/s) per 12 cubic feet (0.34 m^3) of the Class 1, Division 2 cylinder volume (0.00139 $m^3/s/m^3$) defined in Section 2209.5.6. The ventilation system serving the dispensing area shall be directed to the outside in accordance with Section 501.3 of the *International Mechanical Code.*

2209.5.3.2 Operation. Room ventilation shall be provided by a continuous mechanical ventilation system or by a mechanical ventilation system activated by a continuously monitoring hydrogen gas detection system set to activate when a gas concentration exceeds 25 percent of the lower flammable limit (LFL). In either case, the system shall shut down the fueling system in the event of failure of the ventilation system.

The dedicated mechanical ventilation system serving the dispensing area shall operate continuously for not less than ten (10) seconds prior to dispenser operation, during fueling, and for not less than one minute after fueling has been completed. Failure of either the room ventilation system or the dedicated dispensing area ventilation system shall shut down the dispenser.

2209.5.4 Gas detection system. Indoor fast-fill hydrogen fuel- dispensing areas shall be provided with an approved flammable hydrogen gas detection system. The system shall be tested and maintained in accordance with Section 2703.2.9.

2209.5.4.1 System design. The hydrogen gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL).

2209.5.4.2 Operation. Activation of the gas detection system shall result in all of the following:

1. Initiation of distinct audible and visual alarm signals throughout the fire area in which indoor fast fuel-dispensing occurs.
2. Deactivation of all heating systems located in the Indoor fast-fill hydrogen fuel-dispensing area.
3. Activation of the mechanical ventilation system, when the system is interlocked with gas detection.

4. The dispenser shall be shut down and the flow of hydrogen fuel into the building shall be stopped.

2209.5.4.3 Failure of the gas detection system. Failure of the gas detection system shall result in the following:

1. Deactivation of the heating system,
2. Shut down of the fuel-dispensing system,
3. Activation of the mechanical ventilation system, and
4. Where the mechanical ventilation system is interlocked with gas detection, failure of the gas detection system shall cause a trouble signal to sound in an approved location.

2209.5.4.4 Reactivation. Reactivation of fueling equipment or dispensing operations, including gas flow or gas venting into or out of the building shall be by manual restart and conducted by trained personnel.

2209.5.5 Dispenser control system. The dispensing device shall provide a means to prevent over pressurization of the on-board storage container and in accordance with the following:

1. The maximum pressure of the vehicle fuel storage system shall not exceed 125% of the on-board storage container service pressure.
2. The on-board storage container and its integral appurtenances shall not exceed 185°F (85C) during the fueling operation.
3. The hydrogen content of the on-board storage container shall not exceed the gas density of hydrogen at the service pressure and 59°F (15C).
4. An over-pressure relief device [Pressure Relief Valve (PRV)] shall be provided for the dispenser, set at no greater than 140% of the service pressure of the on-board, vehicle fuel storage container.

2209.5.5.1 Fueling system integrity. The dispensing device shall include provisions to check that there are no leaks in the fueling system including the connecting hose and nozzle used to connect the vehicle to the dispenser prior to fueling.

2209.5.5.1.1 Loss of fueling system integrity. The following actions shall occur automatically in the event that a system leak is detected:

1. The dispenser shall be shut down,
2. The flow of gas into the room shall be stopped, and
3. Where mechanical ventilation is provided, room ventilation and dedicated dispensing area ventilation systems shall both be activated.

2209.5.6 Electrical area classification. The area classification for the dispenser shall be Class 1, Division 2 within 15 feet of the point of transfer to the onboard fuel storage system during filling. The area classification shall extend outward in the shape of a cylinder from the point of transfer and from floor to ceiling in accordance with NFPA 70

Exceptions:

1. Vehicles located within the refueling area.
2. Vehicles containing fuel-fired auxiliary equipment where such equipment is shut off completely before entering an area in which ignition sources are not permitted.

2209.5.7 Types I and II construction. Buildings in which indoor fast fuel-dispensing operations take place shall be of Type I or Type II construction. Building construction within 15 feet of the point of transfer to the onboard fuel storage system during filling shall have a fire-resistance rating of not less than 2 hours. Such construction shall be assembled as fire barriers in accordance with Chapter 7 of the *International Building Code*.

2209.5.8 Fire extinguishing systems. Indoor attended fast-fill fuel-dispensing areas designed for maximum fuel delivery masses per refueling event which exceed 2 kg, shall be equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. The design of the sprinkler system shall not be less than that required for Ordinary Hazard Group 2 with a minimum design area of 3,000 square feet (279 m^2).

Where proximate materials or storage arrangements are regulated by other provisions of this code such that a higher level of sprinkler system protection is required, the higher level of sprinkler system protection shall be provided.

2. Add new definitions as follows:

2201.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

FAST-FILL FUEL-DISPENSING SYSTEM. A storage and dispensing system designed to fill motor vehicle fuel tanks with compressed hydrogen. The vehicle fuel tank is filled by connecting to a system designed to provide a fuel fill rate greater than 12 Standard Cubic Feet per Minute (SCFM).-

HYDROGEN FUEL-DISPENSING AREA. A Class 1, Division 2 area defined within 15 feet of the point of transfer to the onboard hydrogen fuel storage system during filling, and extending outward in the shape of a cylinder from the point of transfer and from floor to ceiling in accordance with NFPA 70.

TIME-FILL FUEL-DISPENSING SYSTEM. A storage and dispensing system designed to fill motor vehicle fuel tanks with compressed hydrogen. The vehicle fuel tank is filled by connecting to a system designed to provide a fuel fill rate 12 Standard Cubic Feet per Minute (SCFM) or less.

3. Revise as follows:

2209.3.2.3 Indoors. Generation, compression, storage and dispensing equipment shall be located in indoor rooms or areas constructed in accordance with the requirements of the *International Building Code*, the *International Fuel Gas Code* and the *International Mechanical Code* and one of the following:

1. Inside a building in hydrogen cutoff room designed and constructed in accordance with Section 420 of the *International Building Code*.
2. Inside a building not in a hydrogen cutoff room where the gaseous hydrogen system is listed and labeled for indoor installation and installed in accordance with the manufacturer's installation instructions.
3. Inside a building in a dedicated, time-fill hydrogen fuel dispensing area and designed and constructed in accordance with Section 703.1 of the *International Fuel Gas Code*.
4. Inside a building in a dedicated fast-fill hydrogen fuel dispensing area designed and constructed in accordance with Section 2209.5.

IFGC [F] 706.2 Indoor gaseous hydrogen systems. Gaseous hydrogen systems shall be located in indoor rooms or areas in accordance with one of the following:

1. Inside a building in a hydrogen cutoff room designed and constructed in accordance with Section 420 of the *International Building Code*;
2. Inside a building not in a hydrogen cutoff room where the gaseous hydrogen system is listed and labeled for indoor installation and installed in accordance with the manufacturer's installation instructions; and
3. Inside a building in a dedicated hydrogen fuel dispensing area having an aggregate hydrogen delivery capacity not greater than 12 SCFM and designed and constructed in accordance with Section 703.1.
4. Inside a building in a dedicated, time-fill hydrogen fuel dispensing area and designed and constructed in accordance with Section 703.1 and Section 2209 of the *International Fire Code*.
5. Inside a building in a dedicated fast-fill hydrogen fuel dispensing area designed and constructed in accordance with Section 2209.5.

4. Add new text as follows:

907.2.23 (IBC [F] 907.2.23) Indoor fast-fill hydrogen fuel-dispensing areas. An approved manual and automatic fire alarm system shall be installed in fire areas in which indoor fast-fill fuel-dispensing occurs. Manual fire alarm boxes shall be installed in accordance with Section 907.4.1 in the fast-fill hydrogen fuel-dispensing area.The detection system shall be supervised by an approved central, proprietary, or remote station service or shall initiate an audible and visual signal at a constantly attended on site location.

5. Revise as follows:

2703.2.9.1 Equipment, devices and systems requiring testing. The following equipment, systems and devices shall be tested in accordance with Sections 2703.2.9 and 2703.2.9.2.

1. Gas detection systems, alarms and automatic emergency shutoff valves required by Section 3704.2.2.10 for highly toxic and toxic gases.

2. Limit control systems for liquid level, temperature and pressure required by Sections 2703.2.7, 2704.8 and 2705.1.4.
3. Emergency alarm systems and supervision required by Sections 2704.9 and 2705.4.4.
4. Monitoring and supervisory systems required by Sections 2704.10 and 2705.1.6.
5. Manually activated shutdown controls required by Section 4103.1.1.1 for compressed gas systems conveying pyrophoric gases.
6. Gas detection systems, alarms and automatic emergency shutoff valves required by Section 2209 for hydrogen motor fuel dispensing and generation facilities.

Reason: (2209.5) The term "attended" has been replaced with "qualified operator." ICC identifies the term "attended" with the type of fuelling that is done in NJ and OR where a paid attendant is present and others are not permitted to fuel a vehicle. Fuelling operations should be performed by a **"qualified operator"** (that has been qualified through appropriate training) to ensure that proper safeguards are followed. The term "attended" has also been stricken throughout the document for consistency.

(2209.5.1) The term "listed" equipment should only be used 1) when there is in fact a listing standard, and 2) when listed equipment is available. Unless these conditions are met the requirements for items of equipment should either be 1) not specified, 2) "approved," or 3) "listed or approved."

(2209.5.2) The change is editorial in nature. The section on indoor fast fueling is not intended to replace Section 2209.5.

(2209.5.2.1) Fire alarm boxes (pull stations or alarm initiating devices) should be installed in the area in which fueling occurs. The term INDOOR FAST-FILL HYDROGEN FUEL-DISPENSING AREA is defined by this proposal. The term limits applicability of the requirements to the fueling area.

(2209.5.3) Note the exception to Section 2209.5.3.1.1, Room ventilation rate. The IFGC should be referenced as it sets the fundamental requirements for indoor operation and detection.

(2209.5.3.1) The IFGC allows ventilation to be by natural or mechanical means. Provisions are made for the use of "specially engineered installations." The requirements for indoor fast fueling should be correlated with the IFGC. If specially engineered installations are to be prohibited then a statement along with justification is needed to prohibit them, otherwise they are needed for correlation purposes.

(2209.5.3.1.1 & Figure 2209.5.3.1.1) The proposed change is to establish and clarify two distinct ventilation rates for these operations, a general room ventilation rate, and a dedicated, localized dispensing area ventilation rate. Ventilation rates to be consistent with industry practice by reference to the IFGC.

(2209.5.3.1.2) The proposed change is to establish and clarify two distinct ventilation rates for these operations, a general room ventilation rate, and a dedicated, localized dispensing area ventilation rate. Ventilation rates to be consistent with industry practice by reference to the IFGC.

(2209.5.3.2) This change proposes hydrogen gas monitoring as a safety measure which is consistent with industry practice.

(2209.5.4) Detection (and alarm) systems are to be tested and maintained such that they operate as intended when required. Section 2703.2.9 provides the means to address requirements for testing and maintenance for a wide array of alarm and detection systems. The use of Section 2703.2.9 will provide a consistent approach in control. A modification to Section 2703.2.9 has also been proposed..

(2209.5.4.1) Gas detection systems, when provided to monitor hydrogen fueling systems, should be hydrogen specific. Alternatively a flammable gas detector could be used in circumstances where hydrogen is blended with other fuel gases. Specifying the use of a natural gas detection system is not appropriate for hydrogen based fuels.

(2209.5.4.2) With the exception of item 1 all other changes are editorial in nature. The audible and visual alarm signals should be limited to the fire area in which fueling occurs.

(2209.5.4.3) When any other control system is dependent on the operation of the gas detection system, failure of the gas detection system should prevent dispensing from occurring.

(2209.5.4.4) Editorial. Defueling is not the subject of this code section.

(2209.5.4) The required controls for dispensing systems should prevent the on-board storage container from being overfilled (or over-pressurization).

(2209.5.5.1) A means shall be provided to detect a leak should a leak occur. When leaks are detected fueling should be prevented until leaks are repaired.

(2209.5.5.1.1) Editorial clarity.

(2209.5.6) gnition source control is required by Section 2209.3.2.3.3, 2703.7, and 3503.1.4; as well as coordination with analogous provisions in NFPA 52 Section 9.2.5.

(2209.5.7) The construction of buildings used for indoor fast-fueling of hydrogen should limit the effects of fire and its spread through the use of one or more of the following: 1) Non-combustible construction, 2) a means to provided the spread of a fire by passive measures such as fire-resistive construction, or 3) the use of an automatic fire sprinkler system in the hydrogen fuel-dispensing area in which the fueling occurs. Being that construction as a fire barrier is specified, any proposed openings therein are inherently subject to the provisions of IBC Section 706.7.

(2209.5.8) This provision is designed to address the targeted fleet of indoor fast fill operations such as small lift truck applications.

(2202.1 Definitions) The term "gasified fuels" includes CNG and LNG as well as hydrogen. Section 2209 is specific to hydrogen. Fast fill systems include any system that is designed to flow gas at a rate exceeding 12 scfm. The filling rate of a fast flow system need not exceed the 12 scfm, rather if the capability is there to do so, the system is a fast fill system by definition.

The term "gasified fuels" includes CNG and LNG as well as hydrogen. Section 2209 is specific to hydrogen. To be qualified as a time-fill system it should not be necessary to fill the vehicle overnight or while parked in a fleet yard. The code permits filling at rates less than 12 cfm in indoor locations.

(2209.3.2.3) To correlate with the requirements of new Section 2209.5.

(IFGC [F] 706.1) To correlate with the requirements of new IFC Section 2209.5 and corresponding revisions to IFC Section 2209.3.2.3.

(907.2.23) Fire alarm boxes (pull stations or alarm initiating devices) should be installed in the area in which fueling occurs. Fire areas are bounded by fire-resistive construction. If, for example, a large warehouse is involved and the fueling area is not isolated, audible and visible alarms will be required throughout the building. A "fire area" is the aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or fire-resistance-rated horizontal assemblies of a building. The term fire area confines the requirements to the fueling area.

(2703.2.9.1) To correlate with the requirements of new Section 2209.5.4.

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

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that, while it has merit and is an improvement over code change F155-06/07 (D), there is still need for clarification beyond what the committee is able to undertake with modifications. Concern was expressed over subjective or inconsistent terminology which could cause confusion, such as "qualified operator" in Section 2209.5 versus "trained personnel" in Section 2209.5.4.4, the inconsistent use of the terms "refueling" and "fueling" for the same operation in a number of locations throughout, and "to the extent practical" in Section 2209.5.3.1. It was also noted that in Section 2209.5.1, the proper reference should be to Section 2209.3.1, which is where now-referenced Section 2209.3.2.1 sends the user anyway.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Thomas Joseph, Air Products and Chemicals, Inc., requests Approval as Modified by this public comment.

Modify proposal as follows:

2209.5.1 Location of ancillary equipment. Liquid storage, vaporization and gas storage equipment shall be located outdoors in accordance with Section ~~2209.3.2.1~~ 2209.3.1. Gas compression and processing equipment shall be listed or approved for indoor use or located outdoors in accordance with Section ~~2209.3.2.1~~ 2209.3.1.

2209.5.2.1 Fire alarm and detection system. An approved manual and automatic fire alarm system shall be installed ~~in~~ within 25 feet (22 860 mm) of indoor fast-fill hydrogen fuel-dispensing areas in accordance with Sections 907.2 and 2209.5.7 but not within the electrical area classification established by Section 2209.5.6. Activation of the system shall shut down the dispenser, stop flow of gas into the room and where mechanical ventilation is provided, and activate the ventilation system.

2209.5.3.1 Design. Indoor locations shall be ventilated utilizing air supply inlets and exhaust outlets arranged to provide uniform air movement throughout the space ~~to the extent practical~~. Inlets shall be uniformly arranged on exterior walls near floor level. Outlets shall be located at the high point of the room in exterior walls or the roof.

> **Exception:** Specially engineered installations as allowed by the *International Fuel Gas Code.*

2209.5.3.1.1 Room ventilation rate. The ventilation rate provided to the room in which the fast-fill hydrogen fuel dispensing area is located shall be not less than 1 cubic foot per minute per 12 cubic feet (0.00139 m3/s m3) of room volume.

> **Exception:** Indoor fast-fill hydrogen fuel-dispensing areas in accordance with 2209.5.3.3. ~~exceeding the room volume but not the maximum fuel delivery mass per refueling event as depicted in Figure Table 2209.5.3.1.1 shall not require room ventilation beyond that required for the location in accordance with Section 703.1 of the *International Fuel Gas Code*.~~

~~**[FIGURE 2209.5.3.1.1INDOOR ATTENDED "FAST-FILL" HYDROGEN FUEL-DISPENSING LIMITATIONS]**~~

~~**2209.5.3.1.2 Dedicated dispensing area ventilation rate.** The ventilation system serving the dispensing area shall be at least 1 cubic foot per minute (0.00047 m3/s) per 12 cubic feet (0.34 m3) of the Class 1, Division 2 cylinder volume (0.00139 m3/s/m3) defined in Section 2209.5.6. The ventilation system serving the dispensing area shall be directed to the outside in accordance with Section 501.3 of the *International Mechanical Code*.~~

2209.5.3.3 Areas of large volume. Indoor fast-fill hydrogen fuel-dispensing areas in Group F and S occupancies exceeding the room volume but not the maximum fuel delivery mass per fueling event listed in Table 2209.5.3.3.2 shall not require room ventilation beyond that required for the location in accordance with Section 703.1 of the *International Fuel Gas Code.*

2209.5.3.3.1 Volume verification. The fire code official is authorized to require verification of the room volume or area in accordance with Section 104.7.2.

2209.5.3.3.2 Room volume. The minimum volume of the room in which a dispenser is installed shall be not less than that specified by Table 2209.5.3.3.2 and the maximum quantity of fuel to be dispensed per fueling event shall be limited to an amount not greater than that established by the minimum room volume. The maximum fueling event begins when fuel begins to flow to the vehicle, and is stopped when the flow of fuel has been terminated or when the vehicle being fueled has been filled to capacity.

Table 2209.5.3.3.2 Minimum Room Volume Based on Maximum Fueling Event

Maximum Fuel Quantity per dispensing event	Minimum Room volume
Up to 0.8 kg	1000 m3
>0.8 kg to 1.7 kg	2000 m3
>1.7 kg to 2.5 kg	3000 m3
>2.5 kg to 3.3 kg	4000 m3
>3.3 kg to 4.2 kg	5000 m3

SI to IP: 1 lbm = 2.204 kg, 1 cubic foot = 0.02832 m^3

2209.5.3.3.2.1 Maximum rate. The maximum refueling rate shall be limited to not more than 2 kg/min (845 ft^3/min).

2209.5.3.3.2.2 Room ceiling height. The minimum height of the ceiling of the room, where dispensing occurs, shall be not less than 25 feet.

2209.5.3.3.2.3 Multiple dispensers. When multiple dispensers are installed in a room, the minimum room volume shall be incrementally increased for each additional dispenser.

2209.5.3.3.2.4 Dispenser automatic shutoff. The dispenser shall be equipped with a controller that incorporates an automatic shutoff control to shut down the source of fuel when the maximum fuel quantity per dispensing event is reached or when the vehicle has been fueled to capacity, whichever, is less. In no case shall the amount of fuel being delivered exceed the maximum quantity per dispensing event as shown in Table 2209.5.3.3.1. The controller shall be in accordance with the following:

1. The controller and the automatic shut off control shall be tested in accordance with 2703.2.9 at installation and annually thereafter. A sticker indicating that the required testing has occurred, and bearing the date of testing shall be affixed to the dispenser.
2. Failure of any controller shall shut down the dispensing system.

2209.5.4 Gas detection system. Indoor fast-fill hydrogen fuel- dispensing areas, and the gas dispenser cabinet used to house the dispenser gas distribution system shall be provided with an approved flammable hydrogen gas detection system. The system shall be tested and maintained in accordance with Section 2703.2.9.

2209.5.4.4 Reactivation. Reactivation of fueling equipment or dispensing operations, including gas flow or gas venting into or out of the building shall be by manual restart and conducted by ~~trained~~ qualified personnel.

2209.5.5.1.1 The fueling system hose shall be limited to a maximum length of 25 feet (7.6m) and shall be protected from mechanical damage, from abrasion and from being driven over by a vehicle.

~~**2209.5.5.1.1**~~ **2209.5.5.1.2 Loss of fueling system integrity.** The following actions shall occur automatically in the event that a system leak is detected:

1. The dispenser shall be shut down,
2. The flow of gas into the room shall be stopped, and
3. Where mechanical ventilation is provided, room ventilation and dedicated dispensing area ventilation systems shall both be activated.

2209.5.5.1.3 Fuel transfer system depressurization. Fuel transfer systems shall be capable of being depressurized through the dispenser vent line in order that the transfer hose is able to be depressurized prior to disconnection from the filling connection.

2209.5.6 Electrical area classification. The area classification for the dispenser shall be Class 1, Division 2 within 15 feet of the point of transfer to the onboard fuel storage system during filling. The area classification shall extend outward in the shape of a cylinder from the point of transfer and from floor to ceiling in accordance with NFPA 70

Exceptions:

1. Vehicles located within the ~~refueling~~ fueling area.
2. Vehicles containing fuel-fired auxiliary equipment where such equipment is shut off completely before entering an area in which ignition sources are not permitted.

2209.5.7 Types I and II construction. ~~Buildings in which indoor fast fuel dispensing operations take place shall be of Type I or Type II construction.~~ Building construction within 15 feet of the point of transfer to the onboard fuel storage system during filling shall have a fire-resistance rating of not less than 2 hours. Such construction shall be assembled as fire barriers in accordance with Chapter 7 of the *International Building Code*.

2209.5.8 Fire extinguishing systems. Indoor attended fast-fill fuel-dispensing areas designed for maximum fuel delivery masses per ~~refueling~~ fueling event which exceed 2 kg, shall be equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. The design of the sprinkler system shall not be less than that required for Ordinary Hazard Group 2 with a minimum design area of 3,000 square feet (279 m2).

Where proximate materials or storage arrangements are regulated by other provisions of this code such that a higher level of sprinkler system protection is required, the higher level of sprinkler system protection shall be provided.

907.2.23.1 System interlock. An interlock shall be provided so that the dispenser will not operate if the fire alarm is not operational.

2703.2.9.1 Equipment, devices and systems requiring testing. The following equipment, systems and devices shall be tested in accordance with Sections 2703.2.9 and 2703.2.9.2.

1. Gas detection systems, alarms and automatic emergency shutoff valves required by Section 3704.2.2.10 for highly toxic and toxic gases.
2. Limit control systems for liquid level, temperature and pressure required by Sections 2703.2.7, 2704.8 and 2705.1.4.
3. Emergency alarm systems and supervision required by Sections 2704.9 and 2705.4.4.
4. Monitoring and supervisory systems required by Sections 2704.10 and 2705.1.6.
5. Manually activated shutdown controls required by Section 4103.1.1.1 for compressed gas systems conveying pyrophoric gases.
6. Gas detection systems, controllers, alarms and automatic emergency shutoff valves required by Section 2209 for hydrogen motor fuel dispensing and generation facilities.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: 2209.5.2.1 Fire alarm boxes (pull stations or alarm initiating devices) are to be installed in close proximity to the fuel-dispensing area, but at sufficient distance so as not to jeopardize personnel activating the alarm.

2209.5.3.1 The use of the words "to the extent practical" has been deleted and replaced with language that conveys the intent for the ventilation system.

2209.5.3.1.1 Exception: The exception has been modified to refer to 2209.5.3.3 when unventilated areas are allowed.

Figure 2209.5.3.1: Figure 2209.5.3.1 has been deleted and the data put into table form in Section 2209.5.3.3.

2209.5.3.1.2: The section has been deleted for several reasons. Electrical classification for the area described is found in 2209.5.6. Regardless of the ventilation system a flammable envelope exists at the point of release to a distance where the concentration of hydrogen has been reduced to below the LFL. Modeling shows that a steady state release is capable of generating an envelope to a distance of approximately 20 feet from the dispenser. Ceiling height has been raised to 25 feet minimum in spaces of this nature (See 2209.5.3.3.2.2).

2209.5.3.3 (new): Provisions have been added to recognize what had been included in the exception to 2209.5.3.1.1, however, the provisions have been limited to occupancies of Group F and S. This has been done to restrict the application to commercial occupancies thereby occupancies which involve people sensitive uses, e.g., Group R, M, B, etc. It should be noted that IFGC Section 703.1 requires either natural ventilation (703.1.1), mechanical ventilation (703.1.2) or specially engineered installations (703.1.3). This installation would be a specially engineered installation in accordance with 703.1.3.

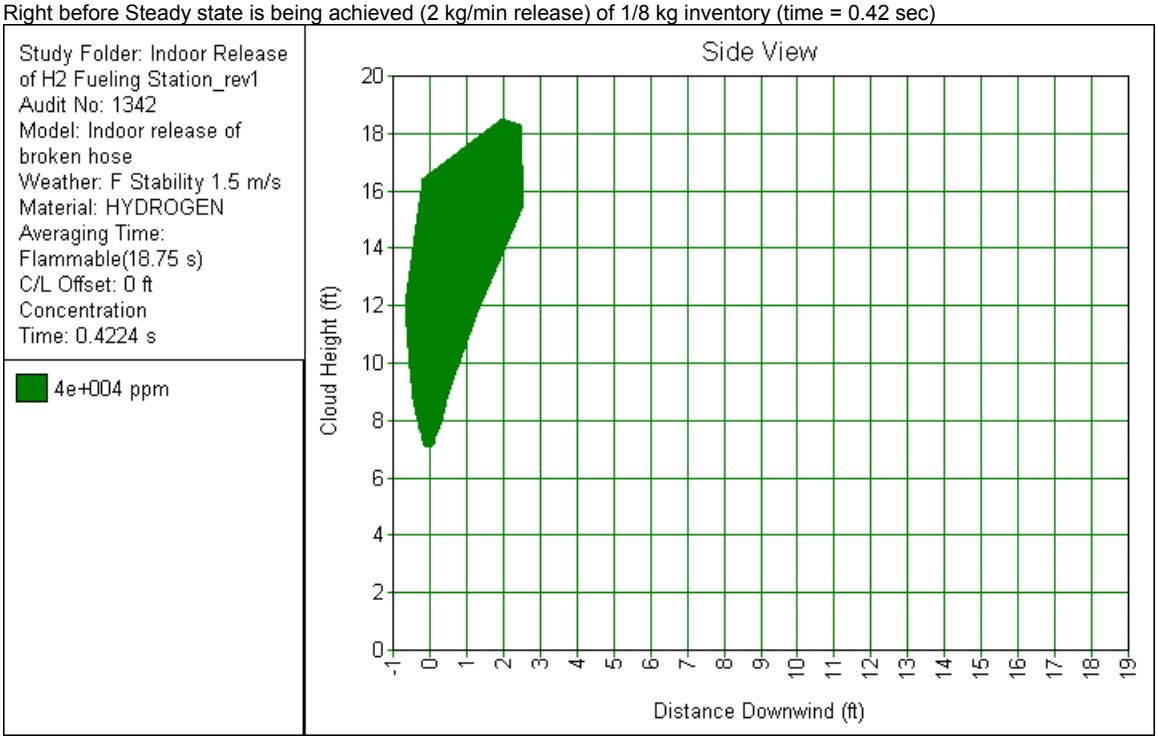
2209.5.3.3.1 (new): Authorization is granted to the code official to require verification of the room volume. This authority is granted now, however, the calculations to validate the design should be independently determined.

2209.5.3.3.2 (new): The minimum volume is related to the maximum fueling event in the form of a table rather than a graph. The maximum rate of fueling is regulated by 2209.5.3.3.2.1.

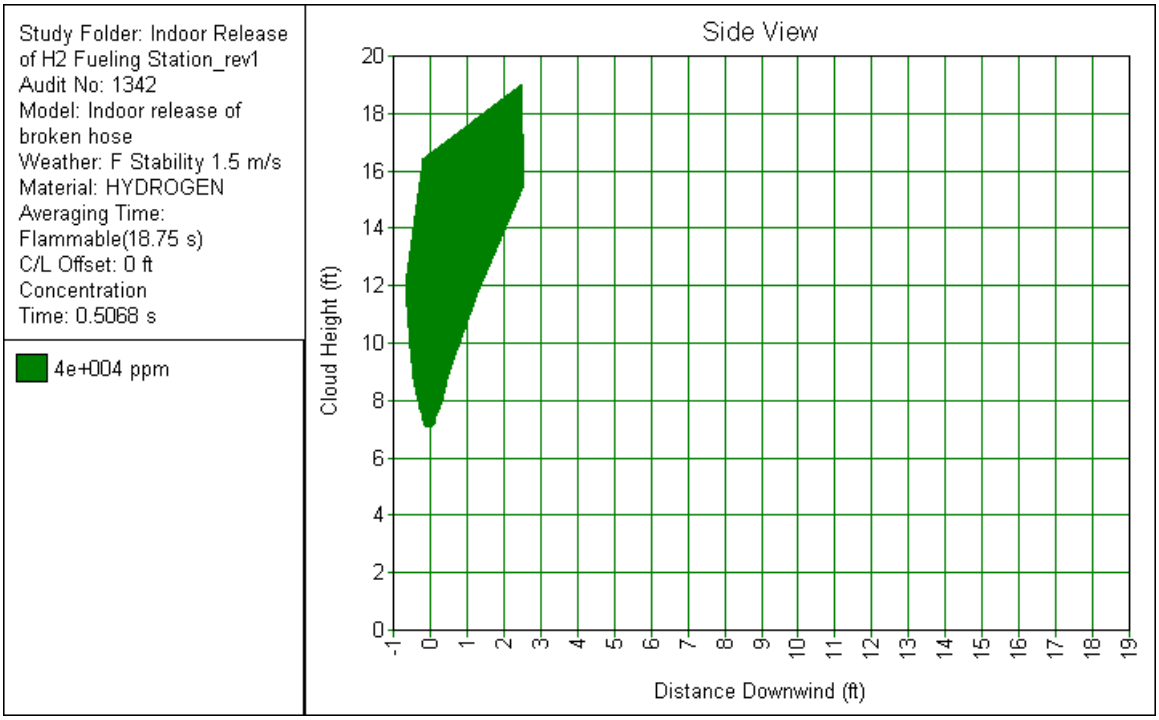
2209.5.3.3.2.1: Requirements to limit the rate of fueling have been established.

2209.5.3.3.2.2: The minimum ceiling height of the room in which fueling occurs is established at 25 feet. The 25 feet has been determined by modeling a release of hydrogen where steady state conditions were achieved at a height of from 20-22 feet after 2 seconds. The flammable envelope below (shown in green) represents that portion of the cloud within a 4% concentration or greater.

Right before Steady state is being achieved (2 kg/min release) of 1/8 kg inventory (time = 0.42 sec)



Flammable cloud after steady state is achieved for a release of 2 kg/min. This is the maximum size of the cloud even if the valves isolating the storage fail & the entire contents of the storage are released into the building



2209.5.3.3.2.3: Requires an increase in room volume when multiple dispensers are present. Although a likely event may be a single point failure, the additional safeguard is felt to be warranted. In addition, requiring additional space is a self limiting control on the size of the operations to be conducted.

2209.5.3.3.2.4: Requires the use of a "controller" on the dispenser that serves multiple functions. The controller is the device that will initiate shut down for a number of reasons including leak detection. In this instance, the controller is required to incorporate an automatic shutoff control so that the fuel supply is shut down when the maximum fueling event has occurred. The items listed in (1) and (2) below establish criteria for testing of the controller and action to be taken in the event of controller failure.

2209.5.4 A gas detection system has been required for the dispenser cabinet that is used to house the dispenser controls. Activation of the gas detection system is required to shut down fueling operations. The gas dispenser cabinet is the most likely place that a leak will be encountered as this is the location where the majority of valves and various components in the filling section are likely to be located.

2209.5.4.4 During the public testimony a question was raised by the committee as to what was required of a Qualified Operator, and in the committee Action reason statement the use of "qualified" versus "trained" was cited as a reason for confusion. Revision of Section 2209.5.4.4 harmonizes the terminology within the section regarding the use of qualified persons. The term "qualified" is preferable and is used throughout the code without further explanation. Several examples of the use of the concept can be found in the following sections [underlined text for emphasis].

Chapter 11 – Aviation Facilities. 1106.5.4 Transfer personnel. During fuel-transfer operations, a qualified person shall be in control of each transfer nozzle and another qualified person shall be in immediate control of the fuel-pumping equipment to shut off or otherwise control the flow of fuel from the time fueling operations are begun until they are completed.

Chapter 14 Fire Safety During Construction and Demolition. 1404.5 Fire watch. When required by the fire code official for building demolition that is hazardous in nature, qualified personnel shall be provided to serve as an on-site fire watch. Fire watch personnel shall be provided with at least one approved means for notification of the fire department and their sole duty shall be to perform constant patrols and watch for the occurrence of fire.

Chapter 22 Motor Fuel Dispensing Facilities and Repair Garages. 2204.1 Supervision of dispensing. The dispensing of fuel at motor fuel-dispensing facilities shall be conducted by a qualified attendant or shall be under the supervision of a qualified attendant at all times or shall be in accordance with Section 2204.3.

Similar provisions directing the use of qualified personnel are found elsewhere in the code. For example: in Section 2207.3 (LPG Fuel Dispensing Attendants); 2404.20 (canopy and membrane structures, standby personnel); 3005.7 (transfer of gases between containers), and others.

2209.5.5.1.1 Hoses should not be allowed to be of unlimited length. The limitation of 25 feet is felt to be a reasonable maximum given the typical fueling configurations. Designs to protect the hose from being driven over also have an effect of limiting the length. Protection of the hose from abrasion, stress (from being driven over) are intended to limit the potential for damage that could lead to premature failure.

2209.5.6 The term "refueling" has been replaced with the term "fueling" to address the committee's request for consistency in the use of the term.

2209.5.7 Requirements for Type I or II construction have been deleted. The IBC allows the use of fire retardant treated wood partitions as did at least one of the legacy codes providing the partitions were nonbearing where the required fire-resistance rating was 2 hours or less. The problem with the proposal as submitted is with existing buildings that have been constructed to requirements such as those under the UBC where the exceptions allowing the use of fire retardant treated wood were not applied.

2209.5.8 The term "refueling" has been replaced with the term "fueling" to address the committee's request for consistency in the use of the term.

907.2.23.1(new): A provision has been added to require an interlock such that the dispensing system will not function if the fire alarm system is not operational. This is to protect against having the fire alarm system shut down for maintenance or other reasons and allowing fueling to continue.

2703.2.9.1: Section has been revised to include controllers in the list of items required to be tested.

Final Action: AS AM AMPC____ D

F243-07/08, Part I
Chapter 24, 105.6.43, 105.7.13, 202 (IBC 202)

NOTE: PART II DID NOT RECEIVE A PUBLIC COMMENT AND IS ON THE CONSENT AGENDA. PART II IS REPRODUCED FOR INFORMATIONAL PURPOSES ONLY FOLLOWING ALL OF PART I.

Proposed Change as Submitted:

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

PART I – IFC

1. Revise Chapter 24 as follows:

CHAPTER 24
TENTS, CANOPIES AND
OTHER MEMBRANE STRUCTURES

SECTION 2401
GENERAL

2401.1 (Supp) Scope. Tents~~, canopies~~ and membrane structures shall comply with this chapter. The provisions of Section 2403 are applicable only to temporary tents~~, canopies~~ and membrane structures. The provisions of Section 2404 are applicable to temporary and permanent tents~~, canopies~~ and membrane structures.

SECTION 2402
DEFINITIONS

~~**CANOPY.** A structure, enclosure or shelter constructed of fabric or pliable materials supported by any manner, except by air or the contents it protects, and is open without sidewalls or drops on 75 percent or more of the perimeter~~

TENT. A structure, enclosure or shelter, with or without sidewalls or drops, constructed of fabric or pliable material supported by any manner except by air or the contents that it protects.

SECTION 2403
TEMPORARY TENTS, CANOPIES AND MEMBRANE STRUCTURES

2403.1 General. All temporary tents~~, canopies~~ and membrane structures shall comply with this section.

2403.2 Approval required. Tents and membrane structures having an area in excess of ~~200~~ 400 square feet (~~19~~ 37 m^2) ~~and canopies in excess of 400 square feet (37 m^2)~~ shall not be erected, operated or maintained for any purpose without first obtaining a permit and approval from the fire code official.

Exceptions:

1. Tents used exclusively for recreational camping purposes.
2. ~~Fabric canopies~~ Tents open on all sides which comply with all of the following:
   - 2.1. Individual ~~canopies~~ tents having a maximum size of 700 square feet (65 m^2).
   - 2.2. The aggregate area of multiple ~~canopies~~ tents placed side by side without a fire break clearance of 12 feet (3658 mm), not exceeding 700 square feet (65 m^2) total.
   - 2.3. A minimum clearance of 12 feet (3658 mm) to all structures and other tents.

2403.3 Place of assembly. (No change to current text)
2403.4 Permits. (No change to current text)

2403.5 Use period. Temporary tents, air-supported, air-inflated or tensioned membrane structures ~~and canopies~~ shall not be erected for a period of more than 180 days within a 12-month period on a single premises.

2403.6 Construction documents. A detailed site and floor plan for tents~~, canopies~~ or membrane structures with an occupant load of 50 or more shall be provided with each application for approval. The tent~~, canopy~~ or membrane structure floor plan shall indicate details of the means of egress facilities, seating capacity, arrangement of the seating and location and type of heating and electrical equipment.

2403.7 Inspections. (No change to current text)
2403.7.1 Inspection report. (No change to current text)

2403.8 Access, location and parking. Access location and parking for temporary tents~~, canopies~~ and membrane structures shall be in accordance with this section.

2403.8.1 Access. (No change to current text)

2403.8.2 Location. Tents~~, canopies~~ or membrane structures shall not be located within 20 feet (6096 mm) of lot lines, buildings, other tents~~, canopies~~ or membrane structures, parked vehicles or internal combustion engines. For the purpose of determining required distances, support ropes and guy wires shall be considered as part of the temporary membrane structure~~,~~ or tent ~~or canopy~~.

Exceptions:

1. Separation distance between membrane structures~~,~~ and tents ~~and canopies~~ not used for cooking, is not required when the aggregate floor area does not exceed 15,000 square feet (1394 m^2).
2. Membrane structures~~,~~ or tents ~~or canopies~~ need not be separated from buildings when all of the following conditions are met:
   2.1. The aggregate floor area of the membrane structure~~,~~ or tent ~~or canopy~~ shall not exceed 10,000 square feet (929 m^2).
   2.2. The aggregate floor area of the building and membrane structure~~,~~ or tent ~~or canopy~~ shall not exceed the allowable floor area including increases as indicated in the *International Building Code*.
   2.3. Required means of egress provisions are provided for both the building and the membrane structure~~,~~ or tent or ~~canopy,~~ including travel distances.
   2.4. Fire apparatus access roads are provided in accordance with Section 503.

2403.8.3 Location of structures in excess of 15,000 square feet in area. (No change to current text)
2403.8.4 Connecting corridors. (No change to current text)

2403.8.5 Fire break. An unobstructed fire break passageway or fire road not less than 12 feet (3658 mm) wide and free from guy ropes or other obstructions shall be maintained on all sides of all tents~~, canopies~~ and membrane structures unless otherwise approved by the fire code official.

2403.9 Anchorage required. Tents~~, canopies~~ or membrane structures and their appurtenances shall be adequately roped, braced and anchored to withstand the elements of weather and prevent against collapsing. Documentation of structural stability shall be furnished to the fire code official on request.

2403.10 Temporary air-supported and air-inflated membrane structures. (No change to current text)
2403.10.1 Door operation. (No change to current text)
2403.10.2 Fabric envelope design and construction. (No change to current text)
2403.10.3 Blowers. (No change to current text)
2403.10.4 Auxiliary power. (No change to current text)

2403.11 Seating arrangements. Seating in tents~~, canopies~~ or membrane structures shall be in accordance with Chapter 10.

2403.12 Means of egress. Means of egress for temporary tents~~, canopies~~ and membrane structures shall be in accordance with Sections 2403.12.1 through 2403.12.8.

2403.12.1 Distribution. (No change to current text)
2403.12.2 Number. (No change to current text)

TABLE 2403.12.2
MINIMUM NUMBER OF MEANS OF EGRESS AND MEANS OF EGRESS WIDTHS FROM TEMPORARY MEMBRANE STRUCTURES~~,~~ AND TENTS ~~AND CANOPIES~~

OCCUPANT LOAD	MINIMUM NUMBER OF MEANS OF EGRESS	MINIMUM WIDTH OF EACH MEANS OF EGRESS (inches)	MINIMUM WIDTH OF EACH MEANS OF EGRESS (inches)
		Tent ~~or Canopy~~	Membrane Structure
10 to 199	2	72	36
200 to 499	3	72	72
500 to 999	4	96	72
1,000 to 1,999	5	120	96
2,000 to 2,999	6	120	96
Over 3,000[a]	7	120	96

For SI: 1 inch = 25.4 mm.

a. When the occupant load exceeds 3,000, the total width of means of egress (in inches) shall not be less than the total occupant load multiplied by 0.2 inches per person.

2403.12.3 Exit openings from tents. (No change to current text)
2403.12.4 Doors. (No change to current text)
2403.12.5 Aisle. (No change to current text)
2403.12.5.1 Arrangement and maintenance. (No change to current text)
2403.12.6 Exit signs. (No change to current text)
2403.12.6.1 (Supp) Exit sign illumination. (No change to current text)
2403.12.7 Means of egress illumination. (No change to current text)
2403.12.8 Maintenance of means of egress. (No change to current text)

SECTION 2404
TEMPORARY AND PERMANENT TENTS~~, CANOPIES~~ AND MEMBRANE STRUCTURES

2404.1 General. All tents~~, canopies~~ and membrane structures, both temporary and permanent, shall be in accordance with this section. Permanent tents~~, canopies~~ and membrane structures shall also comply with the *International Building Code*.

2404.2 Flame propagation performance treatment. Before a permit is granted, the owner or agent shall file with the fire code official a certificate executed by an approved testing laboratory certifying that the tents; ~~canopies and~~ membrane structures and their appurtenances; sidewalls, drops and tarpaulins; floor coverings, bunting and combustible decorative materials and effects, including sawdust when used on floors or passageways, shall be composed of material meeting the flame propagation performance criteria of NFPA 701 or shall be treated with a flame retardant in an approved manner and meet the flame propagation performance criteria of NFPA 701, and that such flame propagation performance criteria are effective for the period specified by the permit.

2404.3 Label. Membrane structures~~,~~ or tents ~~or canopies~~ shall have a permanently affixed label bearing the identification of size and fabric or material type.

2404.4 Certification. An affidavit or affirmation shall be submitted to the fire code official and a copy retained on the premises on which the tent or air-supported structure is located. The affidavit shall attest to the following information relative to the flame propagation performance criteria of the fabric:

1. Names and address of the owners of the tent~~, canopy~~ or air-supported structure.
2. Date the fabric was last treated with flame-retardant solution.
3. Trade name or kind of chemical used in treatment.
4. Name of person or firm treating the material.
5. Name of testing agency and test standard by which the fabric was tested.

2404.5 (Supp) Combustible materials. Hay, straw, shavings or similar combustible materials shall not be located within any tent~~, canopy~~ or membrane structure containing an assembly occupancy, except the materials necessary for the daily feeding and caring of animals. Sawdust and shavings utilized for a public performance or exhibit shall not be prohibited provided the sawdust and shavings are kept damp. Combustible materials shall not be permitted under stands or seats at any time.

2404.6 Smoking. Smoking shall not be permitted in tents~~, canopies~~ or membrane structures. Approved "No Smoking" signs shall be conspicuously posted in accordance with Section 310.

2404.7 Open or exposed flame. Open flame or other devices emitting flame, fire or heat or any flammable or combustible liquids, gas, charcoal or other cooking device or any other unapproved devices shall not be permitted inside or located within 20 feet (6096 mm) of the tent~~, canopy~~ or membrane structures while open to the public unless approved by the fire code official.

2404.8 Fireworks. Fireworks shall not be used within 100 feet (30 480 mm) of tents~~, canopies~~ or membrane structures.

2404.9 Spot lighting. (No change to current text)

2404.10 Safety film. Motion pictures shall not be displayed in tents~~, canopies~~ or membrane structures unless the motion picture film is safety film.

2404.11 (Supp) Clearance. (No change to current text)
2404.12 Portable fire extinguishers. (No change to current text)
2404.13 Fire protection equipment. (No change to current text)
2404.14 Occupant load factors. (No change to current text)
2404.15 Heating and cooking equipment. (No change to current text)
2404.15.1 Installation. (No change to current text)

2404.15.2 Venting. Gas, liquid and solid fuel-burning equipment designed to be vented shall be vented to the outside air as specified in the *International Fuel Gas Code* and the *International Mechanical Code*. Such vents shall be equipped with approved spark arresters when required. Where vents or flues are used, all portions of the tent~~, canopy~~ or membrane structure shall be not less than 12 inches (305 mm) from the flue or vent.

2404.15.3 Location. (No change to current text)
2404.15.4 Operations. (No change to current text)

2404.15.5 Cooking tents. Tents where cooking is performed shall be separated from other tents~~, canopies~~ or membrane structures by a minimum of 20 feet (6096 mm).

2404.15.6 Outdoor cooking. Outdoor cooking that produces sparks or grease-laden vapors shall not be performed within 20 feet (6096 mm) of a tent~~, canopy~~ or membrane structure.

2404.15.7 Electrical heating and cooking equipment. (No change to current text)

2404.16 LP-gas. (No change to current text)
2404.16.1 General. (No change to current text)

2404.16.2 Location of containers. LP-gas containers shall be located outside. Safety release valves shall be pointed away from the tent~~, canopy~~ or membrane structure.

2404.16.2.1 Containers 500 gallons or less. (No change to current text)
2404.16.2.2 Containers more than 500 gallons. (No change to current text)

2404.16.3 Protection and security. Portable LP-gas containers, piping, valves and fittings which are located outside and are being used to fuel equipment inside a tent~~, canopy~~ or membrane structure shall be adequately protected to prevent tampering, damage by vehicles or other hazards and shall be located in an approved location. Portable LP-gas containers shall be securely fastened in place to prevent unauthorized movement.

2404.17 Flammable and combustible liquids. (No change to current text)

2404.17.1 Use. (No change to current text)

2404.17.2 Flammable and combustible liquid storage. Flammable and combustible liquids shall be stored outside in an approved manner not less than 50 feet (15 240 mm) from tents~~, canopies~~ or membrane structures. Storage shall be in accordance with Chapter 34.

2404.17.3 Refueling. Refueling shall be performed in an approved location not less than 20 feet (6096 mm) from tents~~, canopies~~ or membrane structures.

2404.18 Display of motor vehicles. Liquid- and gas-fueled vehicles and equipment used for display within tents~~, canopies~~ or membrane structures shall be in accordance with Sections 2404.18.1 through 2404.18.5.3.

2404.18.1 Batteries. (No change to current text)

2404.18.2 Fuel systems. Vehicles or equipment shall not be fueled or defueled within the tent~~, canopy~~ or membrane structure.

2404.18.2.1 Quantity limit. (No change to current text)
2404.18.2.2 Inspection. (No change to current text)
2404.18.2.3 Closure. (No change to current text)
2404.18.3 Location. (No change to current text)
2404.18.4 Places of assembly. (No change to current text)

2404.18.5 Competitions and demonstrations. Liquid and gas-fueled vehicles and equipment used for competition or demonstration within a tent~~, canopy~~ or membrane structure shall comply with Sections 2404.18.5.1 through 2404.18.5.3.

2404.18.5.1 Fuel storage. (No change to current text)
2404.18.5.2 Fueling. (No change to current text)
2404.18.5.3 Spills. (No change to current text)

2404.19 Separation of generators. Generators and other internal combustion power sources shall be separated from tents~~, canopies~~ or membrane structures by a minimum of 20 feet (6096 mm) and shall be isolated from contact with the public by fencing, enclosure or other approved means.

2404.20 Standby personnel. When, in the opinion of the fire code official, it is essential for public safety in a tent~~, canopy~~ or membrane structure used as a place of assembly or any other use where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest or activity, the owner, agent or lessee shall employ one or more qualified persons, as required and approved, to remain on duty during the times such places are open to the public, or when such activity is being conducted.

Before each performance or the start of such activity, standby personnel shall keep diligent watch for fires during the time such place is open to the public or such activity is being conducted and take prompt measures for extinguishment of fires that occur and assist in the evacuation of the public from the structure.

There shall be trained crowd managers or crowd manager supervisors at a ratio of one crowd manager/supervisor for every 250 occupants, as approved.

2404.21 (Supp) Combustible vegetation. Combustible vegetation that could create a fire hazard shall be removed from the area occupied by a tent~~, canopy~~ or membrane structure, and from areas within 30 feet (9144 mm) of such structures.

2404.22 (Supp) Combustible waste material. The floor surface inside tents~~, canopies~~ or membrane structures and the grounds outside and within a 30 foot (9144 mm) perimeter shall be kept clear of combustible waste and other combustible materials that could create a fire hazard. Such waste shall be stored in approved containers and shall be removed from the premises at least once a day during the period the structure is occupied by the public.

2. Revise as follows:

105.6.43 Temporary membrane structures~~,~~ and tents ~~and canopies~~. An operational permit is required to operate an air-supported temporary membrane structure or a tent having an area in excess of ~~200~~ 400 square feet (~~19~~ 37 m^2)~~, or a canopy in excess of 400 square feet (37 m^2)~~.

Exceptions:

1. Tents used exclusively for recreational camping purposes.
2. ~~Fabric canopies~~ Tents open on all sides which comply with all of the following:
   2.1. Individual ~~canopies~~ tents having a maximum size of 700 square feet (65 m^2).
   2.2. The aggregate area of multiple ~~canopies~~ tents placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700 square feet (65 m^2) total.
   2.3. A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be provided.

105.7.13 Temporary membrane structures~~,~~ and tents ~~and canopies~~. A construction permit is required to erect an air-supported temporary membrane structure or a tent having an area in excess of ~~200~~ 400 square feet (~~19~~ 37 m^2)~~, or a canopy in excess of 400 square feet (37 m^2)~~.

Exceptions:

1. Tents used exclusively for recreational camping purposes.
2. Funeral tents and curtains or extensions attached thereto, when used for funeral services.
3. ~~Fabric canopies~~ Tents and awnings open on all sides which comply with all of the following:
   3.1. Individual ~~canopies~~ tents shall have a maximum size of 700 square feet (65 m^2).
   3.2. The aggregate area of multiple ~~canopies~~ tents placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700 square feet (65 m^2) total.
   3.3. A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be maintained.

SECTION 202
GENERAL DEFINITIONS

CANOPY. ~~See Section 2402.1.~~ A structure or architectural projection of rigid construction over which a covering is attached that provides weather protection, identity or decoration, and may be structurally independent or supported by attachment to a building on one end and by not less than one stanchion on the outer end.

TABLE 906.1 [IBC [F] TABLE 906.1 (Supp)]
ADDITIONAL REQUIRED PORTABLE FIRE EXTINGUISHERS

SECTION	SUBJECT
2404.12	Tents~~, canopies~~ and membrane structures

(Portions of table not shown remain unchanged)

Reason: General:

The pivot point of this proposed code change affecting tents and canopies is the major difference in the way “tents” and “canopies” are defined between the building and fire codes. If it’s agreed the difference is significant and that the two codes need to be correlated, then the majority of changes needed are to be made to the fire code.

With some minor differences in the respective wording, a tent is a tent in either code. But that’s not the case with canopies.

To date, the building code definition of a canopy has been broad and general enough to encompass most everything thought of in the vernacular, be it a covered walkway or the structure that stands over fuel dispensing islands.

Using the current fire code verbiage of a tent or canopy, the following fits the definition of a tent:

This photo fits the definition of a canopy, and at the same time, fits the building code definition of a tent:

In the vernacular, the following are examples of canopies in the building code:

The above photo is also addressed in the fire code as a canopy but it doesn't fit the fire code definition.

Definitions:

The proposed change to the definition of canopy in both codes is to ensure what's being described still includes everything previously thought of in the vernacular but to the exclusion of the fire code's current definition of a canopy which is essentially a tent without sidewalls. Therefore, the definition of canopy is proposed for deletion and relocation in the fire code so as to cover the multiple applications currently found in the code.

By example, while the current definition of canopy in the fire code is found in Chapter 24 Tents, Canopies and Other Membrane Structures, the context and application of a canopy is totally out sync with how canopies are addressed in Chapter 22, Motor Fuel-Dispensing Facilities and Repair Garages. Unlike the temporary nature of tents and canopies in an unchanged Chapter 24, through Chapter 22, canopies are basically independent structures with some permanence expected. In addition, the building code uses the fire code as a reference for the design and construction of canopies at fueling stations. (See IBC Sections 406.5.2, 406.5.2.1 and 2606.10.) By redefining canopies as proposed and locating the revised definition in IFC Chapter 2, it will apply to all sections of the code where canopies are addressed.

Through this proposal, there is no attempt to change the current numerical values found in the code as they relate to exit discharge capacity, the number of exits, occupancy load, etc. What is desired is to change the definitions in both codes to ensure both codes comport with each other.

Code side-by-side comparison:
Attached is a comparison of the building and fire code to help illustrate the need to revise and correlate the definitions of tents and canopies, and how the technical applications of the codes get applied.

IBC Definition	IFC Definition	Permit Thresholds		Proposed change to IBC and IFC	Webster's 3rd New International Dictionary (as referenced in IFC Section 201.4)
		IBC	IFC		
AWNING. An architectural projection that provides weather protection, identity or decoration and is wholly supported by the building to which it is attached. An awning is comprised of a lightweight, rigid skeleton structure over which a covering is attached.	Silent. Not defined.				
CANOPY. An architectural projection that provides weather protection, identity or decoration and is supported by the building to which it is attached and at the outer end by not less than one stanchion. A canopy is comprised of a rigid structure over which a covering is attached.	**CANOPY.** A structure, enclosure or shelter constructed of fabric or pliable materials supported by any manner, except by air or the contents it protects, and is open without sidewalls or drops on 75 percent or more of the perimeter.	>0 sq. ft.	>400 sq. ft.	**Canopy.** A structure or architectural projection of rigid construction over which a covering is attached that provides weather protection, identity or decoration, and may be structurally independent or supported by attachment to a building on one end by not less than one stanchion on the outer end.	**Canopy. 1:** a covering usu. For shelter or protection **a:** a covering usu. of cloth suspended from the four high posts of a bed **d:** a temporary or permanent cover providing shelter and decoration (as over a door or window) **f:** an awning or marquee often stretching from doorway to curb or covering a section of grandstand.
TENT. Any structure, enclosure or shelter which is constructed of canvas or pliable material supported in any manner except by air or the contents it protects.	**TENT.** A structure, enclosure or shelter constructed of fabric or pliable material supported by any manner except by air or the contents that it protects.	>120 sq. ft. (Sec. 3103.1.1)	>200 sq. ft. Exception: Aggregate (w/ less than 12 ft. fire break) or individual fabric canopies = or <700 sq. ft.	**TENT.** A structure, enclosure or shelter, with or without sidewalls or drops, constructed of fabric or pliable material supported by any manner except by air or the contents that it protects.	**Tent. 1:** a collapsible shelter of canvas or other material stretched and sustained by poles, usu. made fast by ropes attached to pegs hammered into the ground, and used for camping outdoors (as by soldiers or vacationers) or as a temporary building (as for theatrical performance) **3:** something that resembles a tent or that servers as a shelter

LIST OF CODE SECTIONS AND TOPICS ADDRESSING TENTS OR CANOPIES									
IBC Chapter and Subject	**IBC**				**IFC Chapter and Subject**	**IFC**			
	Canopy		**Tents**			**Canopy**		**Tents**	
1 Administration					1 Administration	105.6.43	Operational permit threshold	105.6.43	Operational permit threshold
						105.7.13	Construction permit threshold	105.7.13	Construction permit threshold
2 Definitions	202	Definition of canopy	202	Definition of tent	2 Definitions				
3 Use and Occupancy Classification					3 General precautions against fire	315.3.1	Storage prohibitions under unsprinklered “eaves, canopies or other projections or overhangs”.		
4 Special detailed requirements based on use and occupancy	406.5.2	Motor fuel dispensing facilities							
	406.5.2.1	Motor fuel dispensing facilities for hydrogen							
					6 Building services and systems			604.2.9	Emergency power for exit signs in temporary tents
7 Fire-resistance rated construction	705.5.2	Fire walls to extend to outer edge of canopies							
					9 Fire protections systems	T903.2.13	Cross ref for add req fire ext for Hydrogen fueling area canopies		
						T906.1	Additional required fire extinguishers	T906.1	Additional required fire extinguishers
10 Means of egress	1025.6.2.2	Smoke protected seating; roof height			10 Means of egress	1025.6.2.2	Smoke protected seating; roof height		
16 Structural design	T1607.1 (30)	Uniform and concentrated live loads from canopies							
	1607.11.2.4	Ref to T1607.1, Sec 1608 &1609 for uniform live loads of canopies							
					22 Motor fuel-dispensing and repair garages	2202.1	Motor fuel-dispensing facilities; definition of “dispensing device, overhead type” under canopies		
						2203.1(2) Exce	Location of fuel dispensing devices		
						2207.4 Excep	LP		

LIST OF CODE SECTIONS AND TOPICS ADDRESSING TENTS OR CANOPIES									
IBC Chapter and Subject	IBC				IFC Chapter and Subject	IFC			
	Canopy		Tents			Canopy		Tents	
							dispensing under canopies		
						2208.3.1 Excep	CNG dispensing under canopies		
						T2209.3.1 Note c	Minimum separation for gaseous dispensers from other features		
						2209.3.2.6	Motor fuel-dispensing facilities; canopy tops – hydrogen		
						2209.3.2.6.1	Motor fuel-dispensing facilities; canopy top construction – hydrogen – refers to IBC 406.5		
						2209.3.2.6.2	Required automatic fire extinguishing system under fueling canopies		
						2209.3.2.6.2.1	Motor fuel-dispensing facility; Emergency hydrogen discharge from canopy		
						2209.3.2.6.3	Motor fuel-dispensing facility; hydrogen canopy signage		
						2209.3.3	Canopy design to prevent hydrogen gas accumulation		
						2209.5.4.1	Location of hydrogen vent not to be under canopy		
					24 Tents, canopies and other membrane structures	2401.1	Scoping of Canopies	2401.1	Scoping of Tents
						2402.1	Definition of canopy	2402.1	Definition of tent
						2403.1	General statement of compliance to section	2403.1	General statement of compliance to section
						2403.2	Approval threshold and exceptions	2403.2	Approval threshold and exceptions
						2403.5	Limitation of 180 days for temporary canopies	2403.5	Limitation of 180 days for temporary tents
						2403.6	Construction documents	2403.6	Construction documents
						2403.8	Access location and parking for temporary canopies	2403.8	Access location and parking for temporary tents

LIST OF CODE SECTIONS AND TOPICS ADDRESSING TENTS OR CANOPIES									
IBC Chapter and Subject	IBC				IFC Chapter and Subject	IFC			
	Canopy		Tents			Canopy		Tents	
						2403.8.2	Canopy location with exceptions	2403.8.2	Tent location with exceptions
								2403.8.4	Connecting corridors between tents
						2403.8.5	Required fire break around canopies	2403.8.5	Required fire break around tents
						2403.9	Adequate anchorage requirement	2403.9	Adequate anchorage requirement
						2403.11	Seating in canopies to comply w/ Chap 10	2403.11	Seating in tents to comply w/ Chap 10
						2403.12	Means of egress	2403.12	Means of egress
						2403.12.1	Means of egress distribution	2403.12.1	Means of egress distribution
						2403.12.2 & T 2403.12.2	Number of means of egress	2403.12.2 & T 2403.12.2	Number of means of egress
						2404.1	Temp canopies to comply w/ IFC Permanent canopies to also comply w/ IBC	2404.1	Temp tents to comply w/ IFC. Permanent tents to also comply w/ IBC
						2404.2	Canopy material to comply w/ 701	2404.2	Tent material to comply w/ 701
						2404.3	Canopy material label requirement	2404.3	Tent material label requirement
						2404.4	Certification requirement about fabric treatment	2404.4	Certification requirement about fabric treatment
						2404.5	Proximity of combustible materials	2404.5	Proximity of combustible materials
						2404.6	Smoking prohibition	2404.6	Smoking prohibition
						2404.7	Proximity of open flames	2404.7	Proximity of open flames
						2404.8	No fireworks w/in 100 feet of canopy	2404.8	No fireworks w/in 100 feet of tent
						2404.10	Restriction against showing movies under canopies unless using safety film	2404.10	Restriction against showing movies under tents unless using safety film
						2404.15.2	Venting of heating & cooking equip.	2404.15.2	Venting of heating & cooking equip.
						2404.15.5	Canopy separation from cooking tents	2404.15.5	Cooking tent separation from other tents
						2404.15.6	Proximity of outdoor cooking (grease & sparks)	2404.15.6	Proximity of outdoor cooking (grease &

LIST OF CODE SECTIONS AND TOPICS ADDRESSING TENTS OR CANOPIES									
IBC Chapter and Subject	IBC				IFC Chapter and Subject	IFC			
	Canopy		Tents			Canopy		Tents	
									sparks)
						2404.16.2	Location of LP-gas containers	2404.16.2	Location of LP-gas containers
						2404.16.3	LP-gas container security	2404.16.3	LP-gas container security
						2404.17.1	Prohibition against using flammable liquid fueled equipment in canopies	2404.17.1	Prohibition against using flammable liquid fueled equipment in tents
						2404.17.2	Separation requirement between canopy and flammable liquid storage	2404.17.2	Separation requirement between tent and flammable liquid storage
						2404.18	Display of motor vehicles	2404.18	Display of motor vehicles
						2404.18.2	Prohibition of fueling vehicles in canopies	2404.18.2	Prohibition of fueling vehicles in tents
						2404.18.5	Fuel-fired vehicle competitions & demo under canopy	2404.18.5	Fuel-fired vehicle competitions & demo under tent
						2404.19	Separation of generators from canopies	2404.19	Separation of generators from tent
						2404.20	Standby personnel; fire watch	2404.20	Standby personnel; fire watch
						2404.21	Vegetation removal	2404.21	Vegetation removal
						2404.22	Required removal or clearance of waste material from canopies	2404.22	Required removal or clearance of waste material from tent
26 Plastic	2606.10	Criteria for light-transmitting plastics used in canopies at motor fuel-dispensing facilities							
			2702.2.9	Emergency power for exit signs					
31 Special construction	3101.1	Scoping for canopies							
			3103.1	Temp tents (<180 days) to comply w/ IFC. Permanent tents to comply w/ IBC provisions.					
			3103.4	Temporary structures to comply					

LIST OF CODE SECTIONS AND TOPICS ADDRESSING TENTS OR CANOPIES									
IBC Chapter and Subject	IBC				IFC Chapter and Subject	IFC			
	Canopy		Tents			Canopy		Tents	
				with Chap 10					
	3105.1	General reference for canopy requirements							
	3105.3	Reference to Chap 16 for wind or lateral loads and live loads for canopies							
	3105.4	Canopy materials; flame spread							
32 Encroachments into the public right-of-way	3201.4	Limit of drainage water from canopy to encroach upon public right-of-way							
	3202.3.1	Limit of encroachment of canopy structure to public right-of-way							
33 Safeguards during construction	3306.7	Canopy height over walkway							
Appendix D Fire Districts	D102.2.8	Permanent canopies in fire districts							

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

PART I – IFC
Committee Action: Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that it provides a needed clarification and improved correlation between the tent and canopy provisions of the IBC and those of the IFC. It was observed, however, that the lack of a definition for canopy in the IFC may become problematic later on. The action is also consistent with the action of the IBC-General Committee on Part II.

Assembly Action: None

Individual Consideration Agenda

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

Public Comment:

Daniel E. Nichols, New York State Division of Code Enforcement and Administration, representing himself, requests Approval as Modified by this public comment.

Modify proposal as follows:

2404.15.5 Cooking tents. Tents <u>with sidewalls or drops</u> where cooking is performed shall be separated from other tents or membrane structures by a minimum of 20 feet (6096 mm).

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This code proposal was to remove the term 'canopy' and make it synonymous with the term 'tent', both of which are currently defined within the IFC. A comparison table has been provided within the code change proposal showing how the terms are essentially treated the same. However, the subtle change to Section 2404.15.5 drastically changes its meaning.

Currently, IFC Section 2404.15.5 requires tents used for cooking to be separated from other canopies, tents, or other membrane structures by a distance of 20 feet. The difference is that cooking is permitted to be performed in a canopy (tent without sides) and not meet the separation requirements. Clearly, this is more than an editorial change.

The reason for this being such a large change is that many Health Departments (including the State of New York Department of Health) do not find it acceptable to carry food from one tent to another without a covering overhead. The use of a 'canopy' to cook in allows another canopy to be connected as a walkway and then the seating/serving area.

This comment adds the term 'with sidewalls or drops' after the term 'tent' to reintroduce the difference currently recognized in the IFC.

Final Action: AS AM AMPC____ D

NOTE: PART II REPRODUCED FOR INFORMATIONAL PURPOSES ONLY – SEE ABOVE

F243-07/08, PART II – IBC GENERAL

Revise definitions as follows:

SECTION 202
DEFINITIONS

CANOPY. ~~An~~ A permanent structure or architectural projection of rigid construction over which a covering is attached that provides weather protection, identity or decoration, and shall be structurally independent or ~~and is~~ supported by ~~the~~ attachment to a building ~~to which it is attached and at the outer~~ on one end and by not less than one stanchion on the outer end. ~~A canopy is comprised of a rigid structure over which a covering is attached.~~

TENT (Supp). A structure, enclosure or shelter, with or without sidewalls or drops, constructed of fabric or pliable material supported in any manner except by air or the contents it protects.

Reason: Same as Part I.

PART II – IBC GENERAL
Committee Action: **Approved as Submitted**

Committee Reason: Clarifies within the IBC the difference between a tent-like structure and permanent canopy structure such as those used in locations such as fuel service stations.

Assembly Action: **None**

F245-07/08
2701.2.2.1, 2702.1 (IBC [F] 307.2)

Proposed Change as Submitted:

Proponent: Larry Fluer, Fluer, Inc., representing Compressed Gas Association

1. Revise as follows:

2701.2.2.1 Physical hazards. The material categories listed in this section are classified as physical hazards. A material with a primary classification as a physical hazard can also pose a health hazard.

1. Explosives and blasting agents.
2. Flammable and combustible liquids.
3. Flammable solids ~~and gases~~.
4. Organic peroxide materials.
5. Oxidizer materials.
6. Pyrophoric materials.
7. Unstable (reactive) materials.
8. Water-reactive solids and liquids.
9. Cryogenic fluids.
10. Compressed gases.

2. Revise definition as follows:

2702.1 (IBC [F] 307.2) Definitions. The following words and terms shall, for the purposes of this chapter, Chapters 28 through 44 and as used elsewhere in this code, have the meanings shown herein.

PHYSICAL HAZARD. A chemical for which there is evidence that it is a combustible liquid, compressed gas, cryogenic, explosive, ~~flammable gas,~~ flammable liquid, flammable solid, organic peroxide, oxidizer, pyrophoric or unstable (reactive) or water-reactive material.

Reason: All compressed gases are physical hazards by definition. Those gases that are regulated as either physical or health hazards within the context of Chapter 27 are identified in Tables 2703.1.1(1) through 2703.1.1(4). Compressed gases with no listed MAQ are not regulated within Chapter 27; however, they are regulated by Chapter 30.

Deleting the term "and gases" from item 3 of Section 2701.2.2.1 and adding a general category of "compressed gases" and deleting the term "flammable gas" from the definition will correlate this section with the definition of physical hazard.

Revision of the term physical hazard has been made to delete "flammable gas" as it is redundant to the category of "compressed gas."

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

Committee Action: **Disapproved**

Committee Reason: Disapproved at the request of the proponent who wishes to revise the proposal to reflect a consensus that has been reached on how to better deal with physical and health hazards since the proposal was first submitted.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Larry Fluer, Fluer, Inc., representing Compressed Gas Association, requests Approval as Modified by this public comment.

Modify proposal as follows:

2701.2.2.1 Physical hazards. The material categories listed in this section are classified as physical hazards. A material with a primary classification as a physical hazard can also pose a health hazard.

1. Explosives and blasting agents.
2. ~~Flammable and~~ Combustible liquids.
3. Flammable solids, liquids and gases.
4. Organic peroxide ~~materials~~ solids or liquids.
5. Oxidizer ~~materials~~ solids or liquids.
6. Oxidizing gases.

~~6.~~ 7. Pyrophoric ~~materials~~ solids, liquids or gases.
~~7.~~ 8. Unstable (reactive) materials solids, liquids or gases.
~~8.~~ 9. Water-reactive materials solids ~~and~~ or liquids.
~~9.~~ 10. Cryogenic fluids.
~~10. Compressed gases.~~

2702.1 (IBC [F] 307.2) Definitions. The following words and terms shall, for the purposes of this chapter, Chapters 28 through 44 and as used elsewhere in this code, have the meanings shown herein.

PHYSICAL HAZARD. A chemical for which there is evidence that it is a combustible liquid, ~~compressed gas,~~ cryogenic fluid, explosive, flammable solid, liquid or gas, ~~flammable liquid, flammable solid,~~ organic peroxide solid or liquid, oxidizer solid or liquid, oxidizing gas, pyrophoric solids, liquid or gas or unstable (reactive) materials solid, liquid or gas or water-reactive materials, solid or liquid.

Commenter's Reason: The original submittal was initially triggered by the introduction of a definition for oxidizing gases and changes in terminology to clarify the differences between "oxidizer, solids and liquids" vs. oxidizing gases. During discussion with participants at the committee hearings a concern was raised with the inclusion of a general category of "compressed gas" to the list of physical hazards even though the term was used within the definition itself.

The proposed modification adds oxidizing gases to the list of items in Section 2701.2.2.1 and correlates the terminology used in the definition with that used in the list of materials. The apparent inconsistency in terminology for unstable and water reactive materials is driven by the definitions as they appear in material specific chapters 43 and 44 respectively using the term "unstable (reactive) material" to include solids, liquids and gases and the term "water-reactive material" to describe the material regulated which is limited to the solid and liquid form of materials in this category.

Approval of this modification will bring consistency between the definition of physical hazard and the list of materials regulated as physical hazards within the context of the IFC.

Final Action: AS AM AMPC____ D

F246-07/08
2701.5.1, 2701.5.2, Appendix H

Proposed Change as Submitted:

Proponent: William Winslow, representing Washington State Association of Fire Marshals; Pat McLaughlin, representing Sherwin Williams Company

1. Revise as follows:

2701.5.1 Hazardous Materials Management Plan. Where required by the fire code official, ~~each~~ an application for a permit shall include a Hazardous Materials Management Plan (HMMP). The HMMP shall include a facility site plan designating the following:

1. Access to each storage and use area~~s~~.
2. ~~Maximum amount of each material stored or used in each area.~~ Location of emergency equipment.
3. ~~Range of container sizes.~~ Location where liaison will meet emergency responders.
4. ~~Locations of emergency isolation and mitigation valves and devices.~~ Facility evacuation meeting point locations.
5. ~~Product conveying piping containing liquids or gases, other than utility-owned fuel gas lines and low-pressure fuel gas lines.~~ The general purpose of other areas within the building.
6. ~~On and off positions of valves for valves that are of the self indicating type.~~ Location of all aboveground and underground tanks and their appurtenances including, but not limited to, sumps, vaults, below-grade treatment systems, and piping.
7. ~~Storage plan showing the intended storage arrangement, including the location and dimensions of aisles.~~ The hazard classes in each area.
8. ~~The location and type of emergency equipment. The plans shall be legible and drawn approximately to scale. Separate distribution systems are allowed to be shown on separate pages.~~ Show locations of all control areas and Group H occupancies.
9. The emergency exits.

2701.5.2 Hazardous Materials Inventory Statement (HMIS). Where required by the fire code official, an application for a permit shall include ~~a~~an HMIS, such as SARA (Superfund Amendments and Reauthorization Act of 1986) Title III, Tier II Report, or other approved statement. The HMIS shall include the following information:

1. ~~Manufacturer's~~ Product name.
2. ~~Chemical name, trade names, hazardous ingredients~~ Component.
3. ~~Hazard classification~~ Chemical Abstract Service (CAS) Number.
4. ~~MSDS or equivalent~~ Location where stored or used.
5. ~~United Nations (UN), North America (NA) or the Chemical Abstract Service (CAS) identification number~~ Container size.
6. ~~Maximum quantity stored or used on site at one time~~ Hazard classification.
7. Amount in storage ~~conditions related to the storage type, temperature and pressure~~.
8. Amount in use-closed systems.
9. Amount in use-open systems.

2. Delete Appendix H (Supp) in its entirety and substitute a new Appendix H, including Instructions and Figures 1 through 6 as follows:

APPENDIX H
HAZARDOUS MATERIALS MANAGEMENT PLAN (HMMP) AND HAZARDOUS MATERIALS INVENTORY STATEMENT (HMIS) INSTRUCTIONS

SECTION H101 – HMMP

1.1 Part A (See Example Format in Figure 1)
1.1.1 Fill out items and sign the declaration.
1.1.2 Part A of this section is required to be updated and submitted annually, or within 30 days of a process or management change.

1.2 Part B – General Facility Description / Site Plan (See Example Format in Figure 2)

1.2.1 Provide a site plan on 8½- by 11-inch (215 mm by 279 mm) paper, showing the locations of all buildings, structures, outdoor chemical control or storage and use areas, parking lots, internal roads, storm and sanitary sewers, wells, and adjacent property uses. Indicate the approximate scale, northern direction and date the drawing was completed.

1.3 Part C – Facility Storage Map - Confidential Information (See Example Format in Figure 3)

1.3.1 Provide a floor plan of each building identified on the site plan as containing hazardous materials on 8½- by 11-inch (215 mm by 279 mm) paper, identifying the northern direction, and showing the location of each storage and use area.

1.3.2 Identify storage and use areas, including hazard waste storage areas

1.3.3 Show the following:

1.3.3.1 Accesses to each storage and use area.

1.3.3.2 Location of emergency equipment.

1.3.3.3 Location where liaison will meet emergency responders.

1.3.3.4 Facility evacuation meeting point locations.

1.3.3.5 The general purpose of other areas within the building.

1.3.3.6 Location of all aboveground and underground tanks to include sumps, vaults, below-grade treatment systems, piping, etc.

1.3.3.7 Show hazard classes in each area.

1.3.3.8 Show locations of all H occupancies, control areas, and exterior storage and use areas.

1.3.3.9 Show emergency exits.

SECTION H102 – HMIS

2.1.1 Inventory Statement

2.1.1 HMIS Summary Report (See Example Format in Figure 4).

2.1.1.1 Complete a summary report for each control area and H occupancy.

2.1.1.2 The storage summary report includes the HMIS Inventory Report amounts in storage, use-closed, and use-open conditions.

2.1.1.3 Provide separate summary reports for storage, use-closed and use-open conditions.

2.1.1.4 IBC/IFC Hazard Class.

2.1.1.5 Inventory Amount. (Solid (lb), Liquid (gal), Gas (cu ft, gal or lbs)).

2.1.1.6 IBC/IFC Maximum Allowable Quantity. (If applicable, double MAQ for sprinkler protection and/or storage in cabinets. For wholesale and retail sales occupancies, go to Tables 2703.11.1 and 3404.3.4.1 for MAQs.).

2.1.2 HMIS Inventory Report (See Example Format in Figure 5).

2.1.2.1 Complete an inventory report by listing products by location.

2.1.2.2 Product Name

2.1.2.3 Components (For mixtures specify percentages of major components if available)

2.1.2.4 CAS Number. (For mixtures list CAS Numbers of major components if available).

2.1.2.5 Location. (Identify the control area or, if it is an H occupancy, provide the classification, such as H-2, H-3, etc).

2.1.2.6 Container > 55 gal. (If product container, vessel or tank could exceed 55 gallons, indicate yes in column).

2.1.2.7 Hazard Classification. (List applicable classifications for each product).

2.1.2.8 Stored. (Amount of product in storage conditions).

2.1.2.9 Closed. (Amount of product in use-closed systems).

2.1.2.10 Open. (Amount of product in use-open systems).

SECTION H103 – EMERGENCY PLAN

3.1 Emergency Notification (See Example Format in Figure 6)

3.2 Where OSHA or State regulations require a facility to have either an Emergency Action Plan (EAP) or an Emergency Response Plan (ERP), the EAP or ERP shall be included as part of the HMMP.

FIGURE 1
HAZARDOUS MATERIALS MANAGEMENT PLAN
SECTION I: FACILITY DESCRIPTION

PART A – GENERAL INFORMATION

1. Business Name: _____Phone: _____
   Address:_____
   _____

2. Person Responsible for the Business:

Name	Title	Phone
_____	_____	_____

3. Emergency Contacts:

Name	Title	Home Number	Work Number
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

4. Person Responsible for the Application/Principal Contact:

Name	Title	Phone
_____	_____	_____

5. Principal Business Activity:
   _____
   _____
   _____

6. Number of Employees: _____

7. Number of Shifts: _____
   a. Number of Employees per Shift:
      _____
      _____
      _____

8. Hours of Operation:

FIGURE 2
HAZARDOUS MATERIALS MANAGEMENT PLAN
SECTION I: FACILITY DESCRIPTION

PART B – GENERAL FACILITY DESCRIPTION/SITE PLAN

_____
_____
_____
_____
_____
_____
_____
_____
_____

FIGURE 3
HAZARDOUS MATERIALS MANAGEMENT PLAN

SECTION I: FACILITY DESCRIPTION

PART C – FACILITY MAP

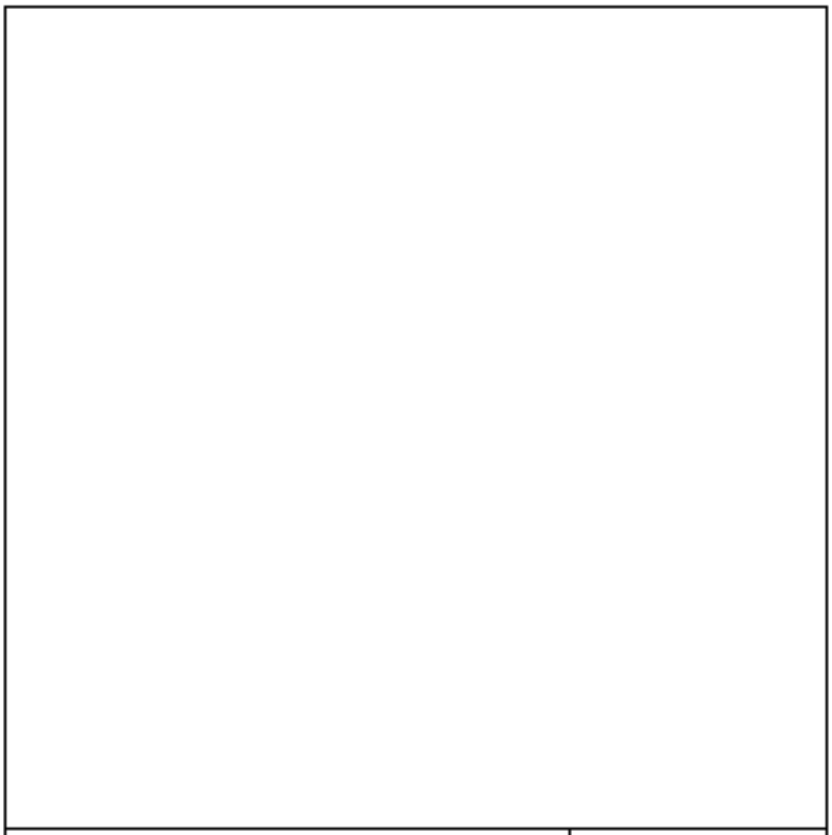


FIGURE 4

SECTION II - HAZARDOUS MATERIALS INVENTORY STATEMENT (HMIS)

HMIS SUMMARY REPORT [1]

(Storage [2] Conditions)[3]

IBC/IFC HAZARD CLASS	HAZARD CLASS	INVENTORY AMOUNT			IBC/IFC MAXIMUM ALLOWABLE QUANTITY[4]		
	(Abbrev)	Solid (lb)	Liquid (gal)	Gas (cu ft, gal, lb)	Solid (lb)	Liquid (gal)	Gas (cu ft, gal, lb)
Combustible Liquid	C2		5			120	
	C3A					330	
	C3B		6			13200	
Combustible Fiber	Loose Baled						
Cryogenics, Flammable	CryO-Flam					45	
Cryogenics, Oxidizing	CryO-Ox					45	
Flammable Gas	FLG						
(Gaseous)				150			1000
(Liquefied)						30	
Flammable Liquid	F1A					30	
	F1B & F1C		5			120	
Combination (1A, 1B, 1C)			5			120	
Flammable Solid	FLS				125		
Organic Peroxide	OPU				0		
	OP1				5		
	OP2				50		
	OP3				125		
	OP4				NL		
	OP5				NL		
Oxidizer	OX4				0		
	OX3				10		
	OX2				250		
	OX1				4000		

(1) Complete a summary report for each control area and H occupancy.

(2) Storage = storage + use-closed + use-open systems

(3) Separate reports are required for use-closed and use-open systems

(4) Include increases for sprinklers or storage in cabinets, if applicable

(This is an example, add additional hazard classes as needed)

FIGURE 5
SECTION II - HAZARDOUS MATERIALS INVENTORY STATEMENT (HMIS)
HMIS INVENTORY REPORT

(Sort Products Alphabetically by Location of Product and then Alphabetically by Product Name)

Product Name (Components)[3]	CAS Number	Location [1]	Container > 55 gal [2]	Haz Class 1	Haz Class 2	Haz Class 3	Stored (lbs)	Stored (gal)	Stored gas[4]	Closed (lbs)	Closed (gal)	Closed gas[4]	Open (lbs)	Open (gal)
ACETYLENE (Acetylene gas)	74-86-2	Control Area 1		FLG	UR2				150					
BLACK AEROSOL SPRAY PAINT (Mixture)	Mixture	Control Area 1		A-L3			24							
GASOLINE, UNLEADED (Gasoline-Mixture (Methyl-t-Butyl Ether-15%; Diisopropyl Ether-7%; Ethanol-11%; Toluene-12%; Xylene-11%))	8006-61-9 1634-04-4 108-20-3 64-17-5 108-88-3 1330-20-7	Control Area 1		F1B				5						
MOTOR OIL 1040 (Hydrotreated Heavy Paraffinic Distillate-85%; Additivies-20%)	64742-54-7 Mixture	Control Area 1		C3B				3						
DIESEL (Diesel - 99-100%; Additives)	68476-34-6 Proprietary	Control Area 2	Yes	C2				225						
TRANSMISSION FLUID (Oil-Solvent Neutral; Performance Additives)	64742-65-0	Control Area 2		C3B				3						
OXYGEN, GAS (Oxygen)	7782-44-7	H-3		OXG					5000					

(1) Identify the control area or, if it is an H occupancy, provide the classification, such as H-2, H-3, etc.
(2) If the product container, vessel, or tank could exceed 55 gallons, indicate yes in the column.
(3) Specify percentages of main components if available
(4) In cubic feet, gallons, or pounds

FIGURE 6
HAZARDOUS MATERIALS MANAGEMENT PLAN
SECTION III: EMERGENCY PLAN

1. In the event of an emergency, the following shall be notified:
a. Facility Liaison

Name	Title	Home Phone	Cell Phone
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

b. Agency

Agency	Contact	Phone Number
Fire Department	_____	_____
LEPC	_____	_____
Other	_____	_____

Reason: IFC Sections 2701.5.1 and 2701.5.2 specify the contents of a Hazardous Materials Management Plan and a Hazardous Materials Inventory Statement when these documents are required by the Fire Code Official. In the 2006 – 2007 code development cycle, Appendix H, covering HMMPs and HMISs, was added to the IFC. The materials in this appendix were taken from the Uniform Fire Code. At the time of its adoption, there was broad agreement among fire service and industry representatives that Sections 2701.5.1, 2701.5.2 and Appendix H needed modifications to make them useful for the code official and cost effective for businesses. These new Sections 2701.5.1, 2701.5.2 and Appendix H were the result of a collaborative effort by the Washington State Association of Fire Marshals and Sherwin Williams Company. They focus on three important goals. First, the HMMP includes information that fire department operations personnel need before and during an emergency response. Second, the HMMP and HMIS provide hazardous materials storage and use information necessary for inspectors. Third, the HMIS is formatted so that plan reviewers can determine the correct occupancy classifications. The amounts of each hazard class in storage and use and the applicable Maximum Allowable Quantities are provided in the HMIS. This coordinates with IFC code change proposal F22306/07, which was approved as modified at the final action hearings in Rochester, New York. This proposal requires the total of each hazard class to be provided in the HMIS.

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

Committee Action: Approved as Modified

Modify the proposal as follows:

Add a new section to Appendix H as follows:

1.4 HMMP short form. Facilities with the maximum allowable quantities or less per control area in Tables 2703.3.3(10) through 2703.1.1(4) and where the threshold planning quantities at 40 CFR Part 355, Sections 302 and 304 are not exceeded, shall be allowed to file a short-form HMMP which shall include the following components.

1.4.1. General facility information:
1.4.2. A simple line drawing of the facility showing the location of storage facilities and indicating the hazard class or classes and physical state of the hazardous materials being stored;
1.4.3. Information that the hazardous materials will be stored and handled in a safe manner and will be appropriately contained, separated and monitored, and
1.4.4. Assurance that security precautions have been take, employees have been appropriately trained to handle the hazardous materials and react to emergency situations, adequate labeling and warning signs are posted, adequate emergency equipment is maintained and the disposal of hazardous materials will be in an appropriate manner.

Add an introduction to Section H102, as follows:

Facilities which have prepared, filed and submitted a Tier II Inventory Report required by the U.S. Environmental Protection Agency (USEPA) or required by a state which has secured USEPA approval for a similar form shall be deemed to have complied with this section.

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal was approved because the committee felt that the proponents had reached agreement on Appendix H format and contents and had appropriately responded to the committee's suggestions in the last cycle. It was suggested that the appendix could be improved by creating a separate section on emergency preparedness/emergency response and to move the items related to those topics out of their current locations in the HMMP section. The modification provides a useful "short form" HMMP that has been accepted by the proponents for facilities not classified in Group H (i.e., having no more than the MAQ per control area).

Assembly Action: None

Individual Consideration Agenda

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

Public Comment:

George Verbryck, Jr., Alert Corp, representing Spa and Pool Chemical Manufacturer's Association, requests Approval as Modified by this public comment.

Further modify proposal as follows:

1.4 HMMP short form. Facilities with the maximum allowable quantities or less per control area in Tables 2703.1.1(1) through 2703.1.1(4) and where the threshold planning quantities at 40 CFR Part 355 Appendix A ~~, Sections 302 and 304~~ are not exceeded, shall be allowed to file a short-form HMMP which shall include the following components.

1.4.1. General facility information:
1.4.2. A simple line drawing of the facility showing the location of storage facilities and indicating the hazard class or classes and physical state of the hazardous materials being stored;
1.4.3. Information that the hazardous materials will be stored and handled in a safe manner and will be appropriately contained, separated and monitored, and
1.4.4. Assurance that security precautions have been taken, employees have been appropriately trained to handle the hazardous materials and react to emergency situations, adequate labeling and warning signs are posted, adequate emergency equipment is maintained and the disposal of hazardous materials will be in an appropriate manner.

(Portions of the proposal not shown remain unchanged)

Commenter's Reason: This Public Comment is editorial in nature. The "Threshold Planning Quantities" are located at Appendix A in Part 355 of Title 40 in the Code of Federal Regulations. Sections 302 and 304 do not appear in Part 355 of Title 40. "Part 302" is entitled Designation, Reportable Quantities and Notification. "Part 304" is entitled Arbitration Procedures for Small Superfund Cost Recovery Claims.

Bibliography
1. 40 CFR Parts 302 and 304
2. 40 CFR Part 355 Appendix A

Final Action: AS AM AMPC____ D

F250-07/08
2703.2.2, Chapter 45 (New)

Proposed Change as Submitted:

Proponent: William Winslow, representing Washington State Association of Fire Marshals

1. Revise as follows:

2703.2.2 Piping, tubing, valves and fittings. ~~Piping, tubing, valves and fittings conveying hazardous materials shall be designed and installed in accordance with approved standards and shall be in accordance with Sections 2703.2.2.1 and 2703.2.2.2.~~ Piping and tubing shall be designed and installed in accordance with the applicable standard listed in Table 2703.2.2. Valves and fittings shall be in accordance with approved standards. Piping, tubing, valves, and fittings shall also be in accordance with Sections 2703.2.2.1 and 2703.2.2.2.

TABLE 2703.2.2
PIPING STANDARDS

PIPING USE	STANDARD
Power piping	ASME B31.1
Process Piping	ASME B31.3
Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia, and Alcohols	ASME B31.4
Refrigeration Piping	ASME B31.5
Gas Transmission and Distribution Piping	ASME B31.8
Building Services Piping	ASME B31.9
Slurry Transportation Piping Systems	ASME B31.11

2. Add standards to Chapter 45 as follows:

ASME

B31.1-04	Power Piping
B31.4-06	Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia, and Alcohols
B31.5-06	Refrigeration Piping
B31.8-03	Gas Transmission and Distribution Piping
B31.11-02	Slurry Transportation Piping Systems

Reason: This code change proposal is simply a clarification. AMSE B31 is the code for pressure piping. It includes 7 standards, each regulating a different type of piping. For instance, ASME B31.3 covers process piping and ASME B31.5 covers ammonia refrigeration piping. The new table will help the code user and code official determine the correct ASME pressure piping standard for his or her application. Chapter45 is updated to include all of the pressure piping standards listed in Table 2703.2.2.

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

Analysis: A review of the standard proposed for inclusion in the code, ASME B31.1-04, B31.4-06, B31.5-06, B31.8-03 and B31.11-02 for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before January 15, 2008.

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that piping design is a complex discipline that design engineers in the field are familiar with and, therefore, they do not need a list of standards in the code. In addition, the committee felt that, since the proponent did not submit the proposed standards for staff and committee review due to the very high cost of doing so, then no jurisdiction could be expected to purchase the standards either. The committee also indicated that the IMC or IFGC would be a more appropriate venue for these discussions.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

William Winslow, Winslow Partnership, representing Washington State Association of Fire Marshals requests Approval as Submitted.

Commenter's Reason: This code change proposal is simply a clarification. AMSE B31 is the code for pressure piping. ASME B31 includes 7 standards, each regulating a different type of piping. For instance, ASME B31.3 covers process piping and ASME B31.5 covers ammonia refrigeration piping. Referring to ASME B31 in 2703.2.2.1 and adding the standards to Chapter 45 will help eliminate confusion as to what standard applies. During the hearings in Palm Springs, there was opposition to this code change proposal, because the opponents felt there are other standards that could be used. The three examples given were documents published by the Chorine Institute, the International Institute of Ammonia Refrigeration (IIAR), and American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). The Chlorine Institute publishes Pamphlet 6, Piping Systems For Dry Chorine, which is intended to provide useful information. It is not a standard. The IIAR's Ammonia Refrigeration Piping Handbook is a guide not a standard. Even though they aren't nationally recognized standards, the Chlorine Institute and IIAR documents refer to ASME B31.5 for piping. ANSI/ASHRAE 15, Safety Standard for Refrigeration Systems, is a nationally recognized standard. ASME B31.5 is a required or normative standard in ASHRAE 15. Another opponent said that ASTM standards could be used instead of ASME B31. ASTM standards cover the design and construction of valves, fittings, tubes and pipes, among other things. The ASTM standards are referenced by ASME B31, and as such, are part of ASME B31, the ASME Code For Pressure Piping. There is no conflict. This proposal should be approved as submitted.

Final Action: AS AM AMPC____ D

F255-07/08

2704.9; 2701.2.2.3 (New), 2701.5.1, 2703.2.9.2, 2703.9, 2704.10, 2702.1, 404.3.1, 404.3.2, 509.1 (IBC [F] 911.1)

Proposed Change as Submitted:

Proponent: Michael Jacoby, Seven Valleys, PA, representing himself

Michael Jacoby Seven Valleys, PA, representing himself

1. Revise as follows:

2704.9 Emergency alarm. An approved manual or automatic emergency alarm system shall be provided in buildings, rooms or areas used for storage of hazardous materials. Emergency alarm-initiating devices shall be installed outside of each interior exit or exit access door of storage buildings, rooms or areas. Activation of an emergency alarm-initiating device shall sound a local alarm to alert occupants and the employees outside on site property, including local residents residing within the (BZ) Buffer Zone, (VZ) Vulnerability Zone or (CSZ) Community Safety Zone via an outside adjunct alarm system of an emergency situation involving hazardous materials.

2. Add new text as follows:

2701.2.2.3 Health hazard record keeping. Maps based on Environmental Protection Agency (EPA), Emergency Management Agency (EMA) calculations and all available. MSDS information showing the (BZ) Buffer Zone (VZ) Vulnerabilities Zones Risk Management's worst case scenario calculations or superseded by a (CSZ) Community Safety Zone determined by municipalities or fire code officials will be shown on a topographical map by using circles representing each size of a zone as part of the HMMP requirement. Maps and other health and public safety related information shall be kept on-site in the fire command Center as well as at the municipality of jurisdiction and shall be available for public inspection or review during business hours or during times of crisis.

3. Revise as follows:

2701.5.1 Hazardous Materials Management Plan. Where required by the fire code official, each application for a permit shall include a Hazardous Materials Management Plan (HMMP). The HMMP shall include a facility site plan designating the following:

1. Storage and use areas.
2. Maximum amount of each material stored or used in each area.
3. Range of container sizes.
4. Locations of emergency isolation and mitigation valves and devices.
5. Product conveying piping containing liquids or gases, other than utility-owned fuel gas lines and low-pressure
   fuel gas lines.
6. On and off positions of valves for valves that are of the self-indicating type.
7. Storage plan showing the intended storage arrangement, including the location and dimensions of aisles.
8. The location and type of emergency equipment. The plans shall be legible and drawn approximately to scale. Separate distribution systems are allowed to be shown on separate pages.
9. All vital maps, records required in accordance with Section 2701.2.2.3 for sites containing hazardous materials reaching a federal or state classification status of SARA Title III, Tier II reports or other approved statements in accordance with Section 2701.5.2 or such level of other classification as being recognized as a health and public safety concern or classification, shall be part of the site basic HMMP ecision-making during an event.

2703.2.9.2 Testing frequency. The equipment, systems and devices listed in Section 2703.2.9.1 shall be tested at one of the frequencies listed below:

1. Not less than annually;
2. In accordance with the approved manufacturers' requirements;

3. In accordance with approved recognized industry standards; ~~or~~
4. In accordance with an approved schedule~~.~~ ; or
5. Outside adjunct alarm warning systems shall be tested, and inspected not less than every six months, with a full system test at least once a year to be done by the fire code official or a certified alarm inspection agency.

2703.9 General safety precautions. General precautions for the safe storage, handling or care of hazardous materials on or off site shall be in accordance with Sections 2703.9.1 through 2703.9.9.

2704.10 Supervision. Emergency alarm, outside adjunct alarm communication system, detection and automatic fire-extinguishing systems required by Section 2704 shall be supervised by an approved central, proprietary or remote station service or shall initiate an audible and visual signal at a constantly attended on-site location.

4. Add new definitions as follows:

2702.1 Definitions. The following words and terms shall, for the purposes of this chapter, Chapters 28 through 44 and as used elsewhere in this code, have the meanings shown herein.

ADJUNCT ALARMS. Communication devices joined or an added extension of a system parallel too but yet separate from an interior alarms system.

BUFFER ZONE. The (BZ) Buffer Zone is the same as (VZ) Vulnerability Zone

HAZMAT EVENT TONE. A digital model tone sequence to be unique to a hazardous material event, to could be used as a model tone if applicable during an unauthorized release/explosions etc. in times of crisis when or before a HMMP is activated. The unique event tone (alarm sound) that could identify the type of event as being HazMat, could then be followed by the NAME and ADDRESS of the site/facility containing the hazardous materials, and then a brief pre-recorded MESSAGE or a PA LIVE LOUD VOICE BROADCAST when applicable during time sensitive events.

HYPERSENSITIVITY LIST. Registries established by government agencies that contain a list of individuals with known acute sensitivity–hypersensitivity to chemicals, (such as allergic reactions etc.) verified by licensed medical personnel as having a hypersensitivity to exposure to chemicals.

OUTSIDE. Being away from, to be outside of a structure, site, facility or business.

OUTSIDE ADJUNCT ALARM SYSTEM. HazMat Alerting communication using Emergency Voice/Alarm Communication (mass notification) capable of audible PA live loud voice broadcasts with the annunciators (speaker array) to be located within the surrounding local community or on site property based on vulnerability zone calculations, acoustical studies etc. outside of a hazardous material site's, physical buildings or structures containing hazardous materials and away from any physical damage that may be caused by massive explosions, fires or chemical releases.

VULNERABILITY ZONE The **(VZ)** Vulnerability Zone also referred to as a Buffer Zone area is an end result of a calculation which will be made by using EPA methods and guidelines based on Hazardous Material MSDS information thus establishing the zone of vulnerability that will include the site's/facility's calculations of a worst-case scenario threat to the public.

COMMUNITY SAFETY ZONE. The (CSZ**)** Community Safety Zone is a safety zone that consolidates all concerns to ensure Public Safety and protect the Health of a community, that can be increased at any time by the fire code official, public safety official or municipal authorities etc. based on community safety concerns. This requirement can only be superseded by a greater requirement without appeal.

5. Revise as follows:

404.3.1 (Supp) Fire evacuation plans. Fire evacuation plans shall include the following:

1. Emergency egress or escape routes and whether evacuation of the building is to be complete or, where approved, by selected floors or areas only.
2. Procedures for employees who must remain to operate critical equipment before evacuating.
3. Procedures for assisted rescue for persons unable to use the general means of egress unassisted.

4. Procedures for accounting for employees and occupants after evacuation has been completed.
5. Identification and assignment of personnel responsible for rescue or emergency medical aid.
6. The preferred and any alternative means of notifying occupants of a fire or emergency.
7. The preferred and any alternative means of reporting fires and other emergencies to the fire department or designated emergency response organization.
8. Identification and assignment of personnel who can be contacted for further information or explanation of duties under the plan.
9. A description of the emergency voice/alarm communication system alert tone and preprogrammed voice messages, where provided or required at such hazardous material sites, facility or structure reaching a federal or state classification of SARA Title III, requiring an (HMIS) Hazardous Material Inventory Statement in accordance with Section 2701.5.2.

404.3.2 (Supp) Fire safety plans. Fire safety plans shall include the following:

1. The procedure for reporting a fire or other emergency.
2. The life safety strategy and procedures for notifying, relocating, or evacuating occupants, including occupants who need assistance.
3. Site plans indicating the following:
   3.1. The occupancy assembly point.
   3.2. The locations of fire hydrants.
   3.3. The normal routes of fire department vehicle access.
4. Floor plans identifying the locations of the following:
   4.1. Exits.
   4.2. Primary evacuation routes.
   4.3. Secondary evacuation routes.
   4.4. Accessible egress routes.
   4.5. Areas of refuge.
   4.6. Exterior areas for assisted rescue.
   4.7. Manual fire alarm boxes
   4.8. Portable fire extinguishers.
   4.9. Occupant-use hose stations.
   4.10. Fire alarm annunciators and controls.
   4.11. Manual pull box location for outside adjunct alarm alerting systems.
5. A list of major fire hazards associated with the normal use and occupancy of the premises, including maintenance and housekeeping procedures.
6. Identification and assignment of personnel responsible for maintenance of systems and equipment installed to prevent or control fires.
7. Identification and assignment of personnel responsible for maintenance, housekeeping and controlling fuel hazard sources.

509.1 (IBC [F] 911.1) (Supp) Features. Where required by other sections of this code and in all buildings classified as high-rise buildings by the *International Building Code*, a fire command center for fire department operations shall be provided. The location and accessibility of the fire command center shall be approved by the fire department. The fire command center shall be separated from the remainder of the building by not less than a 1-hour fire barrier constructed in accordance with Section 706 of the *International Building Code* or horizontal assembly constructed in accordance with Section 711 of the *International Building Code*, or both. The room shall be a minimum of 96 square feet (9 m^2) with a minimum dimension of 8 feet (2438 mm). A layout of the fire command center and all features required by this section to be contained therein shall be submitted for approval prior to installation. The fire command center shall comply with NFPA72 and shall contain the following features:

1. The emergency voice/alarm communication system unit.
2. The fire department communications system.
3. Fire-detection and alarm system annunciator system.
4. Annunciator visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air-handling systems.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.

11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, fire-fighting equipment and fire department access.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.
18. The control center for the hazmat alerting, outside adjunct alarm, mass notification system unit.

Reason: ***Background Information:***

Citizen:

As you will discover I am probably one of the **most involved** citizens / advocates of Building Codes and Standards from the State of Pennsylvania to ever address the ICC about this very serious issue that, as we continue to look into this problem quickly discover that it could already be effecting millions of citizens across our nation.

This very serious HazMat issue has been gaining support/ solidarity as citizens, some of our legislators and now many others are quickly discovering that we have a very serious fire code problem, as many have assumed that the alarms in question were already in place!

The **solidarity that is being shown** is by companies (international and privately owned) school district, churches and citizens who are concerned and have represented their **families employees etc.** in my area in my attempt **to bring awareness** to **others** about this very serious fire code emergency warning issue that continues to gain support.

This community and Hazardous Material site emergency communication notification problem is also being brought to the attention of many others and slowly the **true scope of the size** of this problem is being realized. Millions of citizens are at risk! Now people are starting to pay attention as they take another serious look into this audible emergency communication issue in their communities. Have they put too much emphasis on response and recovery, and nothing on whether they were prepared with the basic alarms that many assumed were already installed?

Those in authority who are very familiar with this classification of industry of now high national concern by DHS are starting to review their situations within their domain to see if they too may have fallen victim to this same fire code issue.

The response by others once this problem has been explained, has been overwhelming.

I am trying my best to bring these Fire code issues to the attention of legislators and others in high authority as quickly as possible to see **if they too have ASSUMED!**

Justification: Use of Emergency Communication

Throughout the last few years while looking into a very serious problem I have unfortunately discovered, that a classification of the deadliest chemical sites/facilities known to man, hazardous material sites of a certain federal / state classification/status did not have any type of **basic outside alarms that many have assumed** were still being installed **to warn their employees** who are **outside** of their buildings, structures or on their property. What is most **important** is without having **immediate** live loud voice communication warnings to warn alert and communicate with our First Responders and the general population that will be **adjacent to the property** such as local businesses, communities, schools churches etc. there is a problem. These sites know that without having these basic audible communication devices, outside adjunct alarms installed they will not have a way to immediately warn/notify, communicate with their employees, the local community or others outside of their structures. Yes just think about this for a second, even when an immanent threat of death **or possible exposure** to toxic chemicals in times of crisis when a **unauthorized release** of Hazardous chemicals, or possibly a **chemical reaction that could cause massive explosions** were in progress there will be no way to immediately warn through audible notification (HazMat alerting) the neighboring public immediately and directly from this site containing the hazardous materials. The fact that the **activation** of their emergency fire alarms systems is required as part of the (HMMP) also referred to by other agencies as the Hazardous Material Off-Site Response Plan is a real problem **if the site does not have any** audible **outside** alarm systems to use as immediate audible emergency communication in place **in their times of crisis.**

This major preparedness **building fire code problem** is the issue that we are trying to correct to **ensure that the public safety** of our nation is protected. Who forgot the basic outside alarms?

What is disturbing is that since the turn-of-the-century, these basic emergency fire alarms as such were being used to supply immediate local communication to the community as basic common sense public service practices by many businesses and were typically installed. Ironically many legislators (law makers) and now the general public are still **ASSUMING that these basic alarms** were in the fire codes **and** these alarms were already installed (in place) at our deadliest chemical sites to immediately warn communicate with the site employees outside of the structures, **neighboring businesses** and local communities before exposure to toxic chemicals during or before **a time sensitive event** when every **second counts.**

Obviously there is a major problem. These alarms are not installed! And now everybody is looking for the language in their Fire Codes.

Now Legislators and other officials, who have also assumed for many years, will have to explain what went wrong.

To complicate matters for our legislators and code officials in our post 9/11 world many citizens **have discovered** that without these **audible communication live loud voice alarms** in place our First Responders will be the first at risk because **there is no live audible loud voice alert communication system in place** during an emergency at these Hazardous Material sites.

These sites in question have been recognized by the federal / state government for many years by a classification that our governments refer to as **SARA Title III etc. or higher** that requires **HMIS** reporting. Sites/facilities as such classification are now considered by our government (DHS) Department of Homeland Security and others as being potential (WMD) Weapons of Mass Destruction targets as legislators and government officials are realizing that we now have a major **public safety and health** fire code problem that could affect millions of citizens across our nation.

The public now realizes that without having any outside alarms in place, **we do not have any** Homeland Security at these facilities. They also are doing the math and have discovered who is expendable!

Many officials have become complacent!

What is more disturbing than ever, is that many legislators forgot about their existing State Registries that have been established since the 1980's that contain a list of citizens who have chemical hypersensitivity. Many also forgot to consider the sick, the elderly and the thousands of citizens with handicaps with special-needs. The right hand was not talking to the left.

As it is today for those sites without outside emergency alarms there is **no protection** or **immediate live loud voice emergency communication** of any type to warn the public who surround these sites who are **outside exposed to the atmosphere** or physical damage

from potential explosions. This reality is starting to set in for many! These sites today have to fall under **ADA requirements** but the basic alarms are not in the codes.

To put things in perspective, this is like having a truckload of HazMat materials traveling through a major metropolitan area without having a basic HORN, audible warning device on the truck.

What is wrong with this picture?

Who forgot about our First Responders, **local businesses and community** surrounding these high threat chemical sites?

Now I want you to take all things into consideration and what do you think you … are in the eyes of those who knew?

This is the justification for the use of emergency alarm communication and these code proposals.

Technical Justification: Additional Information

As you will discover technical information and system communication alert mass notification specifications for immediate warning alert systems have been available for many years by multiple vendors as they continued to evolve throughout the digital age such as is being used in the nuclear industry at a much higher scale and area of acoustical coverage.

New government equipment specifications are evolving as old mechanical devices are being phased out.

Once the outside adjunct alarm code requirements are established in the Fire Code each local authority through their planning would then be able the determine **how to adapt** the new requirements **into their existing local public warning systems** to ensure the public safety of their community is met thus establishing a STANDARD.

Authorities would then have the ability to evaluate the existing alarm communication systems that may be in place, previously installed in the past as a hazardous material site's public service to their neighboring community to determine if the standard for the hazardous material site outside adjunct audible alarm system meets the audible communication requirements of the fire code and only minor requirements such as map record-keeping etc. may be all that is necessary.

To establish the **STANDARD** a minimal of a ½ mile audible live loud voice acoustical radius shall be required unless the vulnerability zone calculations or other requirements are greater.

Zones (examples)

Examples of vulnerability zones and how acoustical studies will be used.

Examples are based on an average of **15-mph Wind Speed**

The AUTHORITY to INCREASE the Vulnerability Zone size:

The municipality of jurisdiction, Fire Code Officials, Public Safety Officer will have the **ability to increase** the zone (audible acoustical) standard requirements for the outside adjunct alarms (Labor & Industry) fire code preparedness to ensure public safety, health and the protection of their community without appeal from the site containing hazardous materials unless superseded by a greater zone radius.

Increasing zone requirements:

The municipality will re-assess the hazardous material concerns of the site once a year at time of the full system inspection review based **on the threat quantity and hazard level** determined by **HMIS and MSDS information as per EPA Methods and guidelines risk management calculations** establishing the initial (vulnerability zone) of the site in relationship to their local community. The existing calculated vulnerability zone supplied by the (EMA) Emergency Management Agency and recognized by federal and or state agencies should be considered and then the **new zone requirements that would** increase the original audible acoustical zone, shall then be called a **(CSZ) Community Safety Zone thus separating the two zones sizes to ensure the local community's preparedness and protection.**

Example of (CSZ) Community Safety Zone usage:

In this example it would be such as a very large hazardous material site already having a federal and or state recognized 2-mile vulnerability zone radius **and** or (New) additional hazardous materials were used, manufactured or stored at this site now having **a higher threat,** the vulnerability zone **will be** increased because the audible acoustical sound messages will not reach a retirement village, schools, shopping center and community park with multiple baseball fields boating etc. that has existed for many years located approx. 2.5 miles away. Therefore the outside adjunct alarm acoustical requirements for this facility's outside audible alarm system will be increased to ensure public safety, health and the protection of the local community because the acoustical coverage area for the outside adjunct alarm area is not deemed adequate will be increased to a 3-mile acoustical radius or greater whatever the municipality of jurisdiction, Fire Code Official or Public Safety Officer deems necessary.

Municipal officials are responsible for preparedness Labor & Industry code enforcement and the protection of their community as well as using the proper procedures as per NIMS training and guidelines in times of crisis,

An example of a HazMat event at a site having a minimal VULNERABILITY ZONE:

The public within the basic ½ mile acoustical **VULNERABILITY ZONE** radius of a hazardous materials facility on a day that there would be a 15-mph wind speed depending on the wind direction would only give the employees of the site or local citizens who are outside fully exposed to the atmosphere (outside in their backyards etc.) approximately 2 to 3 minutes to react before the possibility **of being exposed** to the toxic chemical during or before a an **unauthorized release or a possible explosion**. The length of the time before contact will be shortened depending on their proximity at the time of the **UNAUTHORIZED DISCHARGE** of Hazardous Materials or potential explosions etc. from the site. Every second will be required to gather loved ones with **HYPERSENSITIVITY and or existing health problems** to include those with special-needs to seek shelter **before being exposed** to the toxic (hazardous materials) chemicals just released**.**

The activation of the outside adjunct alarm system:

With an average of 15-mph wind speed with toxic chemicals would then give the local community who is **outside fully exposed** to the atmosphere at a 2-mile distance approx. 8-minutes of time to react assuming the outside adjunct alarm system at the facility was activated immediately by the On-site Coordinator (operator) upon the first unauthorized release of chemicals to the atmosphere via ventilation etc. If not your time before potential exposure to the hazardous chemicals could be much less. At 3-miles for those being outside **exposed to the atmosphere** you will have approx. 12-minutes before the first toxins reach your area depending on the wind direction at that time. Keep in mind that the toxins **will continue** until the source is expended or contained by First Responders etc. The average response time for emergency personnel, First Responders etc. to drive/arrive at the scene could be from 10 to 15 minutes from the activation of the HMMP. It could be much longer for those responders who have to travel a greater distance or have traffic problems etc. Based on conditions the toxins could have already spread up to 3-miles before the First Responders arrived on site.

Failure to activate the outside adjunct alarm system immediately or in the proper order could be handled via a local municipal resolution with a substantial fine or you could use Section 2701.6.2 Permanently out-of service if necessary.

The most important use of the outside adjunct alarms will be for the **local surrounding commercial businesses** who have a responsibility of protecting their employees, who's numbers depending on size or type of business could be into the hundreds. These

businesses will **need every second** to close or shut down their ventilation systems and make sure their employees are inside, and not exposed to the concentrated toxins, massive explosions that may occur or any chemical reactions that may already be in progress.

Basic common sense will tell you, in hazardous material chemical situations, **every second counts!**

Example of a combined use of the outside adjunct alarms thus achieving a better acoustical design for a community.

If a municipality through planning already has an existing community warning system in place surrounding or within their industrial park area the municipality will have the discretion at any time or through their Fire Code Official, Public Safety Officer **to increase the vulnerability zone** by simply **adding the new requirements** for the chemical facility in question to upgrade the already established audible acoustical coverage area for their community.

After the upgrade of the **(CSV) Community Safety Zone** that will increased the zone audible acoustical coverage size /area this **site shall share** the maintenance and upgrades inspections testing etc. proportionally with the rest of the hazardous material sites, of this particular federal or state classification as specifically addressed by the municipality without appeal.

Section-by-section discussion:

(Section 2704.9) The purpose of the change is to add outside adjunct alarms (alert tone emergency voice/alarm communication systems) as a requirement to be installed, tested, 100% operational at hazardous materials sites to protect employees, First Responders and local citizens in the surrounding area of a site containing hazardous materials, as part of the fire codes before or in a time sensitive event, when every second counts.

Without having the immediate basic outside fire alarms commonly called HazMat Alerting systems as an extension of the interior alarm system installed at these high profile, chemical facilities everybody in the vicinity of the hazardous materials site that are outside exposed to the atmosphere unprotected, surrounding the site property is at risk.

As it is today there are no outside adjunct alarms in place other than systems that were voluntarily installed by the owner to immediately warn the employees and surrounding community by using mass warning - notification communication directly to those who are directly outside of these sites, buildings, rooms or areas with known hazardous materials during a time of potential explosions or unauthorized hazardous releases, to prevent toxic exposure or loss of life.

The way the fire code is written today it stops at only notifying the people inside the existing buildings, rooms, or areas. Therefore, anybody outside of these exterior walls working elsewhere on the property, will not get any type of alert tone emergency PA live loud voice/alarm communication warnings that maybe only a short distance away in times of crisis because there are no provisions in the fire codes clearly defined to have these alarms installed.

Many of these facilities with hazardous materials may already have blow-out walls in place in their hazardous material storage areas that are designed to immediately disperse the energy of the explosion / chemical release into the atmosphere, thus by their design will endanger the workers directly outside of the storage areas, as well as the local residents with their children, family members, hypersensitivity individuals, handicap citizens with special-needs, group homes, schools, churches as well as the adjacent businesses from exposure who reside within the hazardous material sites vulnerability zone.

Some additional justification for the use of the outside alarms communication came from truck drivers, who voiced their concerns about when they enter a property with a truckload of hazardous materials and or unknowingly discover that they may have a spill inside of their trailer, and there are no outside alarms installed to immediately warn their fellow truck drivers before they enter the site or even the site employees who are outside on the site property, building, structure, rooms etc. Everybody is at risk because there are no audible communication devices, outside alarms on the property in place.

These immediate warning audible communication systems that have remote access capability via (Mobile Communication Control Centers) will then be able to use a live loud voice PA broadcast to warn our First Responders and others who may be entering the property at the time of the event that would hear the pre-recorded distinctive HazMat Event tone messages or a PA live, loud voice broadcast warning and will then be able to protect the lives of many of our First Responders and possibly thousands of others citizens.

This local emergency immediate on-site communication HazMat Alert system that can be used for local live loud voice communication, **as the communities first line of defense** who are outside exposed to the atmosphere will be a vital tool that will be in place and operational when the (EMA) Emergency Management Agency, (PIO) Public Information Officer arrives at the site to disperse emergency information for recovery or evacuations after or maybe during the hazardous material event.

By simply turning the speaker arrays of the outside adjunct alarm system, which is the outside alert tone emergency PA live loud voice/alarm communication systems, **on or off,** in a given area it will then give the police and other authorities the ability to direct their communication to a specific area to forewarn First Responders or the public such as those who may be stopped on interstate highways to return to their cars and shelter in place or such as a major shift in wind direction or other constantly changing conditions.

Emergency Communication saves many lives! Every First Responder and Fire Code Official knows what would happen if you would not have your basic communications, radio etc. in times of crisis.

The problem is not the use of any alert tone emergency voice/alarm communication systems, but rather how many people assumed that these basic alarms were in place, and where do we go from here?

The same type of basic alarm equipment is being used in the Nuclear Industry at a much larger scale but is not as technically advanced to give PA live loud voice directional emergency communication or pre-recorded warning messages as is what is being used in the industry today.

(Section 2701.2.2.3) Establishing the location of the Vulnerability Zone Maps and vital Health Hazard records.

Maps having a visual zone (circles)(areas) shown are required for those individuals who are listed on State Registries etc. with known hypersensitivity to chemicals to include those individuals with special-needs and the general public, in order to determine evacuation procedures to prevent exposure to chemicals or loss of life.

(Section 2701.5.1) Establishing the location of emergency information (Vulnerability Zone maps, records etc.) as part of the basic requirements of the site **Hazardous Material Management Plan.**

Maps and Health Hazard information, records are required for all individuals who are listed on State Registries with known hypersensitivity to include those individuals with special-needs, the public, in-order to determine evacuation procedures to prevent exposure or loss of life. This information containing maps (blueprints), etc. is just as essential as knowing the basic locations that will be shown on other blueprints showing areas, equipment and shut-off valves etc. of a facility.

(**Section 2703.2.9.2)** Establishing a specific testing frequency for outside adjunct alarm HazMat Alerting systems.

All parties who are reviewing these code proposals should realize by now the level of Hazardous Material sites that are being addressed. It is imperative that a code section be assigned to establish a testing schedule for these communication (HazMat Alerting) live loud voice systems since they are our first line of defense communication, emergency warning during a Hazardous Material event.

Testing of the outside adjunct alarm audible alerting system should be tested /inspected a minimal of every six months such as in the middle of winter (cold temperature) and also in the middle of summer (hottest temperature) to ensure that the systems are 100% operational throughout all temperature ranges should be a requirement of this code. Silent testing of some system components is available in some designed systems today.

By having a defined testing frequency this would help ensure that the system would be operational when required in times of crisis.

The only way this testing frequency could be modified is if superseded by government specifications or system requirements.

(Section 2703.9) To establish a failsafe in the General Safety Precautions to avoid sites with Hazardous Material from shifting Hazardous Materials in-order to avoid code sections within the IFC.

Concerns that hazardous materials could be shifted / relocated into other structures on or off of a Hazardous Material site main storage area that may not be properly constructed based on MSDS information, ICC IFC etc. with the proper fire suppression, or inspected prior to the arrival of new materials (requiring different precautions) that may exceed conditions, or in-order to reduce inventory thus avoiding (HMIS) requirements for sites of the classification known by federal and or state government agencies as SARA Title III etc. that can be found/referenced in IFC Section 2701.5.2.

(Section 2704.10) The outside adjunct alarms, HazMat Alerting, mass notification, emergency alarm emergency voice/alarm communication system with prerecorded voice messages and PA live loud voice broadcast shall be supervised by an on-site coordinator constantly in attendance at the Fire Command Center.

The On-Site Coordinator must supervise all alarm and fire-extinguishing systems at all times, and if at such time during a time sensitive event that a facility is ready to explode or have an un-authorized release it is imperative that the appropriate alarms with pre-determined, pre-recorded messages be activated. Depending on the stage of the time sensitive HazMat event an immediate audible PA live loud voice broadcast may be appropriate when every second counts.

(Section 2702.1 Definitions) The purpose of the change is to supply definitions in such language that can be clearly understood by all parties.

Definitions required explaining the use and or the application for which they will be used.

(Section 404.3.1 Supp) Hazardous Material sites reaching an established Federal or State recognized classification will be required to have emergency voice/alarm communication system alert tone with prerecorded voice messages included as part of their evacuation planning.

Hazardous Material sites of such recognized classification, do not have any type of basic alarms, warning devices, outside emergency voice/alarm communication system on the exterior of the structures etc., to forewarn, give direction to employees who are outside of exterior walls on the site property, First Responders, inspectors and most important the local community, businesses and residents surrounding the site, before or in times of crisis (time sensitive) or potential explosions or unauthorized chemical releases etc.

Emergency Planning and Preparedness, NRC sites etc, Multiple Vendors with installations throughout our nation for many years.

Much larger outside mass notification alert warning systems **have been used** as communication for their first line of defense at nuclear sites for years in the nuclear industry for emergency warning notification. These proposed **much smaller** outside adjunct alarm **HazMat Alerting** live loud voice communication systems shall be **used locally** to **immediately warn** the employees as their first line of defense as well as the surrounding residents, businesses etc. via these smaller mass audible warning notification systems that are more digitally advanced with alert tones, such as HazMat Event Tones along with audible prerecorded messages or PA live voice broadcasts that are commonly referred to as HazMat Alerting systems to be used by the site before or in times of crises during time sensitive HazMat events when every second counts etc.

Voice communication, live loud PA broadcast systems are common today and can also be found being used for local communication on many of our High Schools, College Campuses and local communities for Community Emergency Mass Notification in times of crisis. Sometimes the same system components are used for Homeland Security, Mining, Severe Whether Warnings, Oil and Gas Production, Tsunami Warning and of course HazMat Alerting Systems. The same communication system components can achieve multiple end results by using different speaker arrays alert tones and messages for different applications depending on the acoustical study and other requirements of the site.

(Section 404.3.2 Supp) As part of the Fire Safety Floor Plan identifying the locations in this case being the location of the manual fire alarm pull box, with **override capability (a failsafe)** required for the manual activation of the **outside adjunct alarm alerting systems** will be shown on the Fire Safety Floor Plan.

It is imperative that the location of the manual pull box for the outside adjunct alarm emergency voice/alarm communication alert tone mass notification systems (HazMat Alerting) be shown on **maps** and fire safety floor plans at Hazardous Material sites in case at such time/event that the On-Site Emergency Coordinator is unavailable to activate the outside adjunct alarms system or in the event of failure of the primary internal fire alarm communication system. This is required so that those in authority to include the Hazardous Material site's Safety Personnel, inspectors etc. must know the exact location of the manual pull box, with override capability in-order to activate the outside communication devices as primary line of defense, which will be an **extension of the emergency communication alert alarm** for the safety of the site employees continuing the communication as they evacuate the facility to extend up to a minimal of 2640 ft. radius or beyond based on zone calculations into the surrounding community to protect life, and potential exposure to toxic chemicals.

(Section 509.1 (IBC [F] 911.1) Supp) Establishing the location of the HazMat Alerting, outside adjunct alarm, mass notification system unit to be located within the Fire Command Center.

All fire emergency communication systems head-end equipment must be located at **one central location, clearly established available** to On-site Coordinators, Emergency First Responders and other authorized personnel.

Bibliography: Military Equipment Specification for mass notification, UFC4-021-01 Oct.,05 draft.

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

(Section 2704.9) Minimal cost during new construction estimated. $15,000 to $20,000 or it could be less. Average estimate could be $35,000 to $50,000 depending on the existing conduits telephone poles etc.

The higher the Public Safety and Health concerns of these high profile sites with hazardous material have to local community, the more speaker arrays may be required for coverage. Each site will be unique, depending on the acoustical study and construction cost could be as high as $100,000 + (TBD) to be determined by the local municipality or Fire Code Official etc.

If a Remote – Mobile Communication Control Unit **is available** with the system of choice to remotely control the outside adjunct alarm systems messages PA live loud voice etc. by the local Fire Company the municipality of jurisdiction **shall make** the final determination on whether or not the site will pick up the cost of the remote center after all vulnerability zone calculations and community concerns are addressed.

Committee Action: Disapproved

Committee Reason: The proposal was disapproved because the committee felt that, while it has merit, the committee had numerous concerns, including: it focuses on hazardous material storage when the incidents anticipated here typically happen in transportation scenarios; the system would use "old technology" such as tornado sirens when there are a number of newer, more cost-effective technologies that are available, including, among others, the internet or "reverse 911" systems; it is questionable as to making community vulnerabilities so readily available which could be used in criminal activities or terrorism; it puts the fire code official in the position of having to test the system or relying on certified personnel without providing any guidance on what certification would entail and who the certifying

agency would be; it would allow the fire code official to arbitrarily expand the safety zone without providing any guidance on the criteria that should be met for that to happen; there have been no statistical data provided as to the injuries or deaths that have been averted because of such systems; the proposed text does not say that the system is required; it contains redundant definitions, i.e., buffer zone and vulnerability zone mean the same thing; it contains definitions of terms that are not used in the text, i.e., hypersensitivity list and hazmat even zone; more concise triggers should be provided since this would not be an appropriate requirement for all Group H occupancies; and it was suggested that these requirements be placed in an appendix to the code so that if a community needs the provisions, it will be readily available for adoption.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Michael Jacoby, Seven Valleys, PA, representing himself requests Approval as Modified by this public comment.

Replace proposal with the following:

APPENDIX H
HAZARDOUS SUBSTANCE EMERGENCY COMMUNICATION

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION H101
GENERAL

H101.1 Scope. This appendix with provisions are available for adoption by communities, governments or tribes to establish a standard in communication, at sites with the intent to prevent exposure, loss of life and property.

This code requirement will also be necessary for at such time tribes or governments (Federal, State or others) would like to use these provisions to establish a federal or state standard so that emergency, early warning communication systems at these sites are typically installed and applied.

H101.2 Hazardous material emergency communication. For sites that presently meet the requirements set forth in Section 2701.5.1 or 2701.5.2 of the *International Fire Code* are required to install one-way emergency communications systems as set forth in NFPA 72, using intelligible voice message (audible) real-time or pre-recorded broadcast messages, local wide-area mass notification systems that are able to operate directly from battery backup power and are operational after AC power is lost, by using solar panels as an auxiliary power source, to insure that the rapid dissemination of early warning information intended to prevent hazardous substance exposure no matter what the crisis included but not limited to accidents, other dangerous situations, fire, potential catastrophic events and or terrorist activities that may occur, these communication systems must be installed and operational at all times.

H101.2.1 Retroactive emergency communication requirement. The local wide-area mass notification system specification-requirements in NFPA 72 can be immediately applied retroactively by a community for any site with hazardous substances that required emergency hazardous material responses or have activated their HMMP in the past.

H101.3 Size of the emergency communication system. The size of the early warning, local wide-area mass notification system will be based on the site's type and amounts of hazardous substances, Vulnerability Zone and RMP calculations. A minimal size, coverage area of ½ mile radius is required.

H101.4 Hazardous material record keeping. Parallel backup records of site information for those sites that meet the requirements of Section 2701.5.1 or 2701.5.2 of the *International Fire Code* , to include drawings, maps, etc. will be kept at their local government office, being their authority having jurisdiction.

SECTION H102
Referenced Standards

ICC IFC-06	International Fire Code	H101.2, H101.4
ICCIFC-06	International Fire Code	H101.2, H101.4
NFPA 72-02	National Fire Alarm Code	H101.2, H101.2.1

Commenter's Reason: As suggested by the IFC Code Development Committee, this public comment recommends that the following requirements be placed in an appendix to the code so that if a community needs the provisions, it will be readily available for adoption. These requirements will also be necessary for such time as tribes or governments (Federal, State or others) would like to use these provisions to establish a federal or state standard so that emergency, early warning communication systems at these sites are typically installed and applied.

The emergency early warning communication systems to be installed must be DHS/FEMA IPAWS program compliant reflecting the new state-of-the-art technology in emergency communication systems standards as set forth in NFPA 72

Section-by-section discussion:

H101.2: The communication problems at these sites are already being recognized by the Department of Homeland Security / FEMA and others, **to include the general public** who also recognizes that many people are not able to watch TV, listen to the radio or sit by their telephones, waiting for emergency messages 24 hours a day from auto dialing systems. During hazardous substance / HazMat events every second will count, early warning messages must be immediate in order to prevent exposure or loss of life.

In the past, the President issued an executive order to the Department of Homeland Security to oversee the challenge of upgrading National Standards to provide the American public with lifesaving information no matter what the crisis. This next-generation of public communications is commonly known as the Integrated Public Alert Warning Systems (IPAWS).

H101.2.1: Sites having history of hazardous substance events can now be required to install early warning communication, local wide-area mass notification systems in order to protect the public no matter what the crisis. These problems are already being recognized by the Department of Homeland Security / FEMA and others, to include the general public who also recognizes that many people are not able to watch TV, listen to the radio or sit by their telephones, waiting for emergency messages 24 hours a day from auto dialing systems.

H101.3: System Designers will be using MSDS information, formulas and guidelines already recognized by the Department of Environmental Protection Agency, Labor and Industry and others for many years to determine the size requirement of early warning local wide-area mass notification system to be used in conjunction with the Designer's Acoustical Study, that will be based on the local topography to establish the size of the coverage area required.

H101.4: Establishing the backup location for the site's hazardous substance records during communication and infrastructure failures or when the site's records are unattainable because of the nature or intensity of the hazardous substance event.

It is essential that this provision be available for those communities who frequently experience power outages and communication failures including Internet, satellite or total infrastructure failures once thought secure. Ref: weather (tornadoes, hurricane, snowstorms, flooding) sabotages or equipment failures.

If adolescents can figure out how to take down (disable, place out-of-service) a major communication network, provisions has to be made so communities can be protected by their Authority Having Jurisdiction (AHJ) being the local tribe or local government responsible for the community's health, public safety and protection must have all records and emergency planning readily available at their local government office when communication (infrastructure failures occur) between parties such as the 911 Call Center, Communication Center, Command Center and the site with hazardous materials / substances, when the site's records are unattainable because of the nature or intensity of the hazardous substance event.

The language of the original proposal has been revised so that the location of the backup records can be clearly defined**.** This standard will provide the requirements to insure that parallel up-to-date records **are locally available** to accomplish the mission in times of crisis when communication or other failures occur.

Final Action: AS AM AMPC____ D

F259-07/08

2705.1.11.1 (New), Chapter 45 (New)

Proposed Change as Submitted:

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

1. Add new text as follows:

2705.1.11.1 Process safety management. Where the amount of hazardous material exceeds the threshold planning quantity for process safety management in DOL 29 CFR 1910.119, the process hazard analysis required by said regulation shall be available for on-site review by the fire code official.

2. Add standard to Chapter 45 as follows:

DOL

29 CFR 1910.119--2007 Process Safety Management of Highly Hazardous Chemicals

Reason: The process hazard analysis (PHA) required by the Process Safety Management regulation includes valuable information that will help the fire code official determine if a chemical system is suitable for the use intended. The PHA describes hazards that could occur, such as leaks, excess level, over pressure and over temperature, and what safety controls and other features are included to prevent dangerous incidents. Reviewing the PHA can greatly simplify the fire code official's design review and system approval.

Cost Impact: The code change proposal will not increase the cost of construction. The code official can only ask for the PHA if it is already required by Federal Regulations.

Analysis: Review of proposed new standard DOL 29 CFR 1910.119-2007 indicated that, in the opinion of ICC Staff, the standard did **not** comply with ICC standards criteria.

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved for consistency with the action on code change F258-07/08.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Larry Fluer, Fluer, Inc., representing Compressed Gas Association, requests Approval as Modified by this public comment.

Modify proposal as follows:

2705.1.11.1 Process safety management. Where ~~the amount of hazardous material exceeds the threshold planning quantity for process safety management in DOL 29 CFR 1910.119, the~~ a process hazard analysis (PHA) ~~required by said regulation~~ has been developed or provided in accordance with the requirements of federal law, the PHA shall be made available ~~for~~ on-site ~~review by~~ for the fire code official upon request.

~~**DOL**~~

~~29 CFR 1910.119–2007 Process Safety Management of Highly Hazardous Chemicals~~

Commenter's Reason: The original submittal was not entirely clear regarding the need to provide a process hazards analysis (PHA), and ICC staff indicated that reference to DOL 29 CFR in this instance was not appropriate. Industry representatives expressed concern with what appeared to be an invitation to the fire official to "review" the PHA suggesting that the PHA would be subject to comments from the fire official. On the other hand the proponents indicated that the review was for the purpose of obtaining a more in depth understanding of the process needs and of the hazards identified by the designers.

In some cases, OSHA under Process Safety regulations (29 CFR 1910.119), the requirement is for the user to "develop" a PHA which must then be retained for inspection upon request. On the other hand, EPA can require submittal of a PHA under the requirements for Risk Management Plans (under 40 CFR)

The proposed modification is intended to provide access to the PHA for the fire code official upon request. The access to the PHA granted to the code official is restricted to "on site" access in order to limit distribution of the document. Required PHAs will have been provided to the federal entity in some instances and not in others. It is intended that the PHA made available to the code official be retained on site and access to the PHA will be limited to on site use. In cases where a PHA is has been required by the use of Section 2701.3.3.11 under the performance requirements of Chapter 27, the PHA will have been submitted to the fire code official for review.

Approval of the proposed modification will provide information sharing for documents prepared under or submitted to meet federal requirements while removing the expressed concern that the PHA is subject to "review" by an outside authority that does not exercise a right of control over its preparation. This change does not alter the requirements for PHA under Section 2701.3.3.11 in any way.

Final Action: AS AM AMPC____ D

F261-07/08

3201.1, 3201.1.1 (New), 3201.1.2 (New)

Proposed Change as Submitted:

Proponent: Larry Fluer, Fluer, Inc., representing Compressed Gas Association

Revise as follows:

3201.1 (Supp) Scope. Storage, use and handling of cryogenic fluids shall comply with this chapter. Cryogenic fluids classified as hazardous materials shall also comply with Chapter 27 for general requirements. Partially full containers containing residual cryogenic fluids shall be considered as full for the purposes of the controls required.

Exceptions:

1. Fluids used as refrigerants in refrigeration systems (see Section 606).
2. Liquefied natural gas (LNG), which shall comply with NFPA 59A.

~~Oxidizing cryogenic fluids, including oxygen, shall comply with NFPA 55 and Chapter 40 as applicable. Flammable cryogenic fluids, including hydrogen, methane and carbon monoxide, shall comply with NFPA 55 and Chapters 22 and 35 as applicable. Inert cryogenic fluids, including argon, helium and nitrogen, shall comply with CGA P-18.~~

3201.1.1 Material specific requirements. Bulk flammable cryogenic fluid systems including hydrogen, methane and carbon monoxide, and bulk oxidizing gas systems shall comply with NFPA 55 and Chapters 22 and 35 as applicable. Bulk inert cryogenic fluids, including argon, helium and nitrogen, shall comply with CGA P-18.

3201.1.2 Liquid oxygen in home health care. Liquid oxygen in home health care shall also be in accordance with Section 4006.

Reason: Chapter 32 provides the fundamental generic requirements for cryogenic fluids. Material specific provisions that have been developed for "bulk" systems are found in either NFPA 55 or CGA P-18. The term "bulk" was not included in the references to standards which creates a potential conflict between the IFC and NFPA 55 as well as a potential conflict between the requirements of Chapter 32 and Section 4006 (2007 Supplement). Bulk hydrogen and oxygen systems are further defined in chapters 35 and 40.

Reorganization of Section 3201.1 will bring further clarity to the application of this chapter and direct the user to NFPA 55 for detailed provisions relative to bulk systems.

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

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that non-bulk cryogenic fluids and oxidizing gases need to be included along with a broader reference to Chapter 40.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Larry Fluer, Fluer, Inc., representing Compressed Gas Association, requests Approval as Modified by this public comment.

Modify proposal as follows:

3201.1.1 Material specific requirements. ~~Bulk~~ Flammable cryogenic fluid systems including hydrogen, methane and carbon monoxide, and bulk oxidizing gas systems shall comply with NFPA 55 and Chapters 22 and 35 as applicable. ~~Bulk~~ Inert cryogenic fluids, including argon, helium and nitrogen, shall comply with CGA P-18.

3201.1.2 Liquid oxygen in home health care. Liquid oxygen in home health care shall also be in accordance with ~~Section 4006~~ Chapter 40.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: During the code development hearings a question was raised by a committee member as to the application of Section 3201.1.1 when "non-bulk" quantities of cryogenic fluids were considered. In addition a broader reference to the requirements of Chapter 40 was requested. In response to this latter request, a reference to Chapter 40 has now been included in Section 3201.1.2.

The response to the first question regarding "non-bulk" cryogens the following explanation is provided. Complete material specific requirements for bulk cryogenic fluid systems do not currently exist within the body of work published in Chapter 32; therefore, a reference to NFPA 55 is appropriate. As drafted, the 2006 Edition of the IFC defers to NFPA 55 for requirements including bulk and non-bulk. The code change as originally proposed limited the reference to NFPA 55 to bulk systems for flammable and oxidizing cryogens and to CGA P-18 for bulk inert gas systems while recognizing the requirements for non-bulk systems established in the IFC.

After further examination the requirements which refer the user to these other documents remain unchanged with the exception of a change in format and a needed reference to Chapter 40 for liquid oxygen in home health care.

Chapter 32 was developed as a "generic" chapter for all cryogenic fluids to provide a set of general requirements regardless of quantity. On the other hand there are established and recognized standards published that are hazard specific for "bulk" gases as defined. In some cases there are use specific requirements that are imposed such as those found in Chapter 22 imposed on hydrogen when used in fueling applications. There is a need for further work on this chapter to either eliminate requirements that could be confused to be applicable to bulk gas systems or to provide material specific detail in a more complete way.

Approval of the public comment will provide direction to the code user with a reference to Chapter 40 for liquid oxygen systems in home health care. The reference to NFPA 55 remains unchanged and the user is directed to NFPA 55 for requirements for non-bulk and bulk systems integral to Chapter 32 as applicable.

Final Action: AS AM AMPC____ D

F270-07/08
3403.6.2, 3403.6.2.1, Chapter 45 (New)

Proposed Change as Submitted:

Proponent: William Winslow, representing Washington State Association of Fire Marshals

1. Revise as follows:

3403.6.2 Design ~~and~~, fabrication and installation of piping systems and components. Piping systems and components shall be designed ~~and~~, fabricated and installed in accordance with the applicable standard listed in Table 3403.6.2 and Chapter 5 of NFPA 30, except as modified by this section.

TABLE 3403.6.2
PIPING STANDARDS

PIPING USE	STANDARD
Power piping	ASME B31.1
Process Piping	ASME B31.3
Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia, and Alcohols	ASME B31.4
Building Services Piping	ASME B31.9

3403.6.2.1 Special Materials. Low-melting-point-materials (such as aluminum, copper, and brass), materials that soften on fire exposure (such as nonmetallic materials), and nonductile material (such as cast iron) shall be acceptable for use underground in accordance with ~~ASME B31.9~~ the applicable standard listed in Table 3403.6.2. When such materials are used outdoors in above-ground piping systems or within buildings, they shall be in accordance with ~~ASME B31.9~~ the applicable standard listed in Table 3403.6.2 and one of the following.

1. Suitably protected against fire exposure.
2. Located where leakage from failure would not unduly expose people or structures.
3. Located where leakage can be readily controlled by operation of accessible remotely located valves.

In all cases, nonmetallic piping shall be used in accordance with Section 5.3.6 of NFPA 30.

2. Add standards to Chapter 45 as follows:

ASME
B31.1-04 Power Piping
B31.4-06 Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia, and Alcohols

Reason: This code change proposal is a clarification and a technical correction. NFPA 30, Chapter 5 references ASME B31, Code for Pressure Piping, not ASME B31.9, which covers Building Services Piping. In many cases, ASME B31.9 is not the correct standard for flammable liquid piping. As shown in the table, there are 4 standards within ASME B31, Code for Pressure Piping that could cover flammable and combustible liquid piping. The code user must select the correct standard based on the application.

From NFPA 30, Chapter 5: "The design, fabrication, assembly, test, and inspection of piping systems shall be suitable for the expected working pressures and structural stresses. Compliance with applicable sections of ASME B31, Code for Pressure Piping, and the provisions of this chapter shall be considered prima facie evidence of compliance with the foregoing provisions."

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

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that there are other standards that are available from other promulgators that may be applicable and because the proponent requested disapproval to revise the proposal.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

William Winslow, Winslow Partnership, representing Washington State Association of Fire Marshals requests Approval as Submitted.

Commenter's Reason: This code change proposal is a clarification and a technical correction. NFPA 30, Chapter 5 references ASME B31, Code for Pressure Piping, not ASME B31.9, which covers Building Services Piping. In many cases, ASME B31.9 is not the correct standard for flammable liquid piping. As shown in the table, there are 4 standards within ASME B31, Code for Pressure Piping that cover flammable and combustible liquid piping. The code user must select the correct standard based on the application.

From NFPA 30, Chapter 5: "The design, fabrication, assembly, test, and inspection of piping systems shall be suitable for the expected working pressures and structural stresses. Compliance with applicable sections of ASME B31, Code for Pressure Piping, and the provisions of this chapter shall be considered prima facie evidence of compliance with the foregoing provisions."

During the hearings in Palm Springs, there was opposition to this code change proposal, because the opponents felt there are other standards that could be used. I reviewed a few of the American Petroleum Institute recommended practices. For piping, all of them referenced ASME B31, the ASME Code for Pressure Piping. There is no conflict. This proposal should be approved as submitted for clarification and to correct the reference to ASME B31.9.

Final Action: AS AM AMPC____ D

F272-07/08

3404.2.7.3.2, 3404.2.9.6.3, Chapter 45 (New)

Proposed Change as Submitted:

Proponent: Steve M. Crothers, Fire Department, Seattle, WA, representing Washington State Association of Fire Marshals;Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Services Review Committee

1. Revise as follows:

3404.2.7.3.2 ~~Vent line~~ Flame arresters and ~~venting devices~~ pressure-vacuum vents. Listed or approved flame arresters or pressure-vacuum (PV) vents shall be installed in normal vents of aboveground tanks containing Class IB and IC liquids, unless the use of such devices can result in damage to the tank. ~~Vent line~~ End-of-line flame arresters and ~~venting devices~~ pressure-vacuum vents shall be installed and maintained in accordance with their listing~~s~~ and API 2210. ~~Use of~~ In-line flame arresters ~~in piping systems~~ shall be installed and maintained in accordance with their listing and API 2028.

2. Delete without substitution:

~~**3404.2.9.6.3 Flame arresters.** Approved flame arresters or pressure vacuum breather valves shall be installed in normal vents.~~

(Renumber subsequent sections)

3. Add standard to Chapter 45 as follows:

API

RP 2210– (2000) Flame Arresters for Vents of Tanks Storing Petroleum Products

Reason: The code currently requires that a flame arrester or pressure-vacuum (PV) vent be installed in the normal vent of all protected aboveground tanks containing flammable or combustible liquids but it does not have a similar requirement for other aboveground tanks whose design and construction provides significantly less protection and control than a protected tank. This code change accomplishes several things, it:

1. Correlates the requirement for flame arresters and PV vents so that regardless of the tank type the requirement is the same.
2. Modifies the current provision requiring a flame arrester for all flammable and combustible liquids so that a flame arrester or PV vent is only required for tanks containing Class IB and IC liquids. Because the primary function of a flame arrester is to prevent the unrestricted propagation of flame through flammable gas or vapor mixtures, it is not necessary to install a flame arrester on tanks containing combustible liquids. Additionally, because flame arresters can not prevent detonation or control flame propagation speeds associated with a detonation (flame speeds greater than the speed of sound), flame arresters are not effective when installed on tanks containing Class IA liquids. This revision establishes a requirement for a tank vent flame arrester only when there is a sound technical reason to provide one.

3. Provides a much needed correlation between the IFC and NFPA 30, *Code for Flammable and Combustible Liquids*, for establishing when flame arresters are required on tank vents.
4. Adds a new exception that allows omitting the use of a tank vent flame arrester in situations where the properties of the liquid can cause the tank to be damaged by use of the device. Properties of some Class IB and IC liquids such as crystallization, polymerization and corrosivity can present obstructions in flame arresters that may justify omitting the device.
5. Adds a new reference to API Recommended Practice 2210 that addresses the installation and maintenance of end-of-line flame arresters and designates the existing API reference document (API 2028) to more appropriately address in-line flame arresters. An end-of-line flame arrester is a flame arrester that is mounted at the end of a pipe (flanged or threaded inlet connection) and vents directly to the atmosphere whereas an in-line flame arrester may be mounted upstream of a pressure/vacuum relief vent, or may be located upstream of a specified maximum length of vent piping to atmosphere.
6. Addresses maintenance of flame arresters and pressure vacuum vents. Not only is proper installation of these devices important but their maintenance is critical. A blocked or corroded flame arrester can render the device ineffective and lead to catastrophic results. This code change adds a new requirement to maintain flame arresters and PV devices in accordance with their listings and API standards.

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

Analysis: Review of proposed new standard API RP 2210-(2000) indicated that, in the opinion of ICC Staff, the standard did not comply with ICC standards criteria.

Committee Action: **Disapproved**

Committee Reason: The committee felt that the proposal included no technical justification for the deletion of Section 3404.2.9.6.3 which contains an important and necessary tank vent safeguard in favor of a reference to a document, API RP 2210, that contains no technical requirements on end-of-line flame arrestors. The proposed referenced document contains only anecdotal historical information on flame arrestors.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Steven M. Crothers, City of Seattle Fire Department, representing Washington State Association of Fire Marshals, requests Approval as Modified by this public comment.

Modify proposal as follows:

3404.2.7.3.2 Flame arresters and pressure-vacuum vents. Listed or approved flame arresters or pressure-vacuum (PV) vents shall be installed in normal vents of aboveground tanks ~~containing Class I-B or I-C liquids, unless the use of such devices can result in damage to the tank~~. End-of-line flame arresters and pressure-vacuum vents shall be installed and maintained in accordance with their listings ~~and API 2210~~. In-line flame arresters shall be installed and maintained in accordance with their listing and API 2028.

Delete the referenced standard in Chapter 45 as follows:

~~API RP 2210 – (2000) Flame Arresters for Vents of Tanks Storing Petroleum Products~~

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The code change has been modified to address the Committee's concern. Any reference to API RP 2210 has been eliminated and the intent of the modified proposal is two fold.

First, the proposal brings parity to the venting requirement for protected aboveground tanks and other tank systems. Section 3404.2.7.3 applies to tank vents for normal venting on all types of tanks – underground tanks, steel aboveground tanks, and protected aboveground tanks. Section 3404.2.9.6 provides additional requirements only for protected aboveground tanks. Section 3404.2.7.3.2 as currently written does not require that a flame arrester be installed in a normal tank vent. It merely requires that flame arresters be installed in accordance with their listings. On the other hand, Section 3404.2.9.6.3 applies only to protected aboveground tanks and provides a clear mandate that flame arresters be installed in normal vents. There is no legitimate reason why a protected aboveground tank should have a more restrictive venting requirement than other tank systems if the requirement is to address a fire and life safety hazard. The code change proposal appropriately relocates the mandate for the flame arrester in the general section (3404.2.7.3) applying to all tank systems and deletes the unique requirement for a flame arrester for protected aboveground tanks in Section 3404.2.9.6.3.

Second, the terminology throughout Section 3404.2.7.3 has been updated to be consistent with terminology that is more common in the industry.

Final Action: AS AM AMPC____ D

F273-07/08
3404.2.7.5.2

Proposed Change as Submitted:

Proponent: Steve M. Crothers, Fire Department, Seattle, WA, representing Washington State Association of Fire Marshals

Revise as follows:

3404.2.7.5.2 Filling, emptying and vapor recovery connections. Filling, emptying and vapor recovery connections to tanks containing Class I, II or IIIA liquids shall be located outside of buildings not more than 5 feet (1524 mm) above the adjacent ground level at a location free from sources of ignition and not less than 5 feet (1524 mm) away from building openings or lot lines of property that can be built on. Such openings shall be provided with a liquid-tight cap which shall be closed when not in use and properly identified.

Reason: This proposed change specifies that the tank fill location is required to be at ground level. It may seem obvious that the tank fill opening is required to be at ground level where the fuel truck driver has direct access. However, numerous designs have been submitted that propose to hoist fuel delivery truck hose lines up the exterior of the building to rooftops and other building levels above the finished ground level. The designs actually meet the letter of the code as it is currently written and so this code change in needed to clarify the intent.

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

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that the connection location should be related to where the delivering vehicle is parked. It was also suggested that the provision might be better located in Section 3404.2.7.5.6.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Steve M. Crothers, City of Seattle Fire Department, representing Washington State Association of Fire Marshals, requests Approval as Modified by this public comment.

Modify proposal as follows:

3404.2.7.5.2 Filling, emptying and vapor recovery connections. Filling, emptying and vapor recovery connections to tanks containing Class I, II or IIIA liquids shall be located outside of buildings ~~not more than 5 feet (1524 mm) above the adjacent ground level~~ in accordance with Section 3404.2.7.5.6 at a location free from sources of ignition and not less than 5 feet (1524 mm) away from building openings or lot lines of property that can be built on. Such openings shall be provided with a liquid-tight cap which shall be closed when not in use and properly identified.

3404.2.7.5.6 Location of connections that are made or broken. Filling, withdrawl and vapor-recovery connections for Class I, II and IIIA liquids which are made and broken shall be located outside of buildings, not more than 5 feet above the finished ground level, in an approved location in close proximity to the parked delivery vehicle. Such ~~at a~~ location shall be away from sources of ignition and not less than 5 feet (1524 mm) away from building openings. Such connections shall be closed and liquid tight when not in use and shall be properly identified.

Commenter's Reason: The Committee's concerns have been addressed in this modified proposal. The intent of the original proposal was to specify that the hose connection on the building is required to be within 5 feet of the finished ground level. In response to the Committee's concerns the specific requirement has been relocated to Section 3404.2.7.5.6 with a pointer from Section 3404.2.7.5.2 to give more clarity to the reader. Also in response to the Committee's comment, the revised proposal now requires that the connection be located in an approved location near where the fuel delivery vehicle will be parked.

Final Action: AS AM AMPC____ D

F282-07/08
3501.1

Proposed Change as Submitted:

Proponent: Robert J. Davidson, Davidson Code Concepts, LLC, representing himself

Revise as follows:

3501.1 (Supp) Scope. The storage and use of flammable gases shall be in accordance with this chapter. Compressed gases shall also comply with Chapter 30 and cryogenic fluids shall also comply with Chapter 32. Bulk hydrogen compressed gas systems and bulk liquefied hydrogen gas systems shall also comply with NFPA 55. Hydrogen motor fuel-dispensing stations and repair garages and their associated above ground hydrogen storage systems shall also be designed and constructed in accordance with Chapter 22.

Exceptions:

1. Gases used as refrigerants in refrigeration systems (see Section 606).
2. Liquefied petroleum gases and natural gases regulated by Chapter 38.
3. Fuel-gas systems and appliances regulated under the *International Fuel Gas Code* other than gaseous hydrogen systems and appliances.
4. ~~Hydrogen motor fuel-dispensing stations and repair garages and their associated above ground hydrogen storage systems designed and constructed in accordance with Chapter 22.~~
5. ~~5.~~ 4. Pyrophoric gases in accordance with Chapter 41.

Reason: The Hydrogen Motor Fuel-Dispensing and Generation requirements found in Chapter 22 of the International Fire Code (IFC) requires compliance with Chapter 35 of the IFC at Sections 2209.1, 2209.3.2.3.3, 2209.3.2.4, and 2209.3.2.6. However, when you go to Chapter 35, Section 3501.1 Exception 4 effectively prevents the application of Chapter 35 and loops you back to Chapter 22.

By deleting Exception 4 accompanied by the addition of "**Hydrogen motor fuel-dispensing stations and repair garages and their associated above ground hydrogen storage systems shall also be designed and constructed in accordance with Chapter 22."** To the end of Section 3501.1, the more specific requirements of Chapter 22 (Section 2209) will apply along with any Chapter 35 requirements not addressed in Chapter 22.

There are no conflicts created with this modification, it is similar to the approach taken with flammable or combustible liquid motor fuels, and any potential conflicts are eliminated by application of Section 102.9, with Chapter 22 being the more specific language and Chapter 35 being the general language for this application of the code.

> *"102.9 Conflicting provisions. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable."*

The *International Fuel Gas Code* (IFGC) requires compliance with *International Fire Code* (IFC) Chapter 35 in Sections 635.1, 701.1, 703.2, and 704.3. However, when the code official or the regulated community goes to IFC Chapter 35, Section 3501.1, Exception 3 effectively stops application of Chapter 35 and sends them back to the *International Fuel Gas Code*.

If you research the history of the addition of the gaseous hydrogen system requirements to the IFGC the proposal authors identified the exception in the IFC Chapter 35 and indicated they were not changing it because they did not want Chapter 35 to be applied to fuel gases other than gaseous hydrogen. This has caused confusion with code officials and the regulated community that have tried to apply the I-Codes in a comprehensive manner.

Adding the language, "**other than gaseous hydrogen systems and appliances**" to Exception 3 clarifies that Chapter 35 is to be applied to gaseous hydrogen systems that are regulated by the IFGC without extending application of Chapter 35 to other fuel gas systems and appliances regulated by the IFCG.

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

Committee Action: **Approved as Submitted**

Committee Reason: The proposal was approved because the committee felt that it provides a needed resolution of conflict within the scoping text of Chapter 35.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Larry Fluer, Fluer, Inc., representing Compressed Gas Association, requests Approval as Modified by this public comment.

Modify proposal as follows:

3501.1 (Supp) Scope. The storage and use of flammable gases shall be in accordance with this chapter. Compressed gases shall also comply with Chapter 30 and cryogenic fluids shall also comply with Chapter 32. Bulk hydrogen compressed gas systems and bulk liquefied hydrogen gas systems shall ~~also~~ comply with NFPA 55. Hydrogen motor fuel-dispensing stations and repair garages and their associated above ground hydrogen storage systems shall also be designed and constructed in accordance with Chapter 22.

Exceptions:

1. Gases used as refrigerants in refrigeration systems (see Section 606).
2. Liquefied petroleum gases and natural gases regulated by Chapter 38.
3. Fuel-gas systems and appliances regulated under the *International Fuel Gas Code* other than gaseous hydrogen systems and appliances.
4. Pyrophoric gases in accordance with Chapter 41.

Commenter's Reason: The intent of Section 3501.1 is to refer the user to NFPA 55 for the requirements of bulk hydrogen systems whether liquid or gaseous. The NFPA standards for bulk hydrogen systems were first established in 1968 with NFPA 50A applying to gaseous hydrogen systems and NFPA 50B applying to liquefied hydrogen systems. It is appropriate that the direction to NFPA 55 be clarified and limited to bulk systems which have been defined in the 2007 Supplement to the IFC in Section 3502.1. This clarification will avoid having users misapply Table 3504.2.1 which was intended to be limited to non-bulk applications.

Approval of the modification as shown adds clarity to the code and gives the user direction for requirements when bulk hydrogen systems are involved.

Final Action: AS AM AMPC____ D

F288-07/08

3603.2, Chapter 45 (New)

Proposed Change as Submitted:

Proponent: Cynthia A. Wilk, Department of Community Affairs-Division of Codes and Standards, State of NJ

1. Revise as follows:

3603.2 Quantities exceeding the maximum allowable quantity per control area. The storage and use of flammable solids exceeding the maximum allowable quantity per control area as indicated in Section 2703.1 shall be in accordance with Chapter 27 and this chapter.

Exception: Buildings storing mattresses containing polyurethane foam that have been tested and meet the criteria of 16 CFR Part 1633 are not required to comply with this chapter and Chapter 27.

2. Add standard to Chapter 45 as follows:

CPSC

16 CFR Part 1633-06 Standard for the Flammability of Mattress Sets

Reason: (IFC) Using the definitions set forth in the International Fire Code Section 3602.1 polyurethane foam has been identified to be a flammable solid. Tests have documented that polyurethane foam meets both the "burns so vigorously and persistently when ignited…" and the "self sustained flame rate of greater than 0.1 inch (2.5mm) per second…" benchmarks[i]. This creates a large impact applying the fire code to storage and mercantile facilities that contain both upholstered furniture and mattresses. The proper application of the code with this new information would require compliance with this chapter due to the presence of flammable solids. While this may not be widely known or understood by enforcers or the regulated community, it is nevertheless substantiated by current code language and laboratory analysis.

The proposed exception will provide a remedy for all Group S and M occupancies that store, display, and sell mattresses. The CPSC Standard 16 CFR Part 1633 tests the mattress assembly as it is produced which more accurately represents the hazard as a whole. As per section 1633.3(b) of the CPSC Standard, the mattress set is deemed to comply when the test specimen meets both of the following criteria: (1) The peak rate of heat release does not exceed 200 Kilowatts at any time within the 30 minute test and (2) The total heat release does not exceed 15 megajoules for the first ten minutes of the test. Without this exception, facilities that store, display or sell mattresses, like those facilities that store, display or sell upholstered furniture containing polyurethane foam, would be required to comply with Chapter 36 and Chapter 27.

[i] 16 CFR1500.44 Testing For National Association of State Fire Marshals on Poly Foam/ Vtec #100-2519-2/Tested: November 2, 2006. VTEC Laboratories Inc.

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

Analysis: Review of proposed new standard CPSC 16 CFR 1633-06 indicated that, in the opinion of ICC Staff, the standard did not comply with ICC standards criteria.

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because the committee felt that it was beyond the scope and intent of the definition of flammable solid and an inappropriate attempt to get polyurethane foam designated as a flammable solid based on an inappropriate test standard that is intended for chemicals, not ordinary consumer products containing foam material. Such a designation could have a negative impact on a variety of consumer issues including requiring otherwise ordinary occupancies to be classified as Group H due to the presence of polyurethane foam or products containing it, such as mattresses and upholstered furnishings. This is also consistent with the action taken on code change G29-07/08.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Robert J. Davidson, Davidson Code Concepts, LLC, representing National Association of Fire Marshals (NASFM), requests Approval as Modified by this public comment.

Modify proposal as follows:

3603.2 Quantities exceeding the maximum allowable quantity per control area. The storage and use of flammable solids exceeding the maximum allowable quantity per control area as indicated in Section 2703.1 shall be in accordance with Chapter 27 and this chapter.

> **Exception:** ~~Buildings storing mattresses containing polyurethane foam that have been tested and meet the criteria of 16 CFR Part 1633 are not required to comply with this chapter and Chapter 27.~~ Buildings or structures containing polyurethane foam materials or products that are protected with an automatic sprinkler system and the use of mattresses containing polyurethane foam, in use as tested, that meet the criteria of 16 CFR Part 1633.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: During the code development hearing for this proposal there was testimony that polyurethane foam is a flammable solid based upon research and testing. Opponents objected to the proposal because they believed the code did not intend to regulate polyurethane foam as a flammable solid and because to do so would have a tremendous affect on numerous occupancies containing polyurethane foam products. There was testimony that the test standard currently contained within the International Codes was intended to apply to chemicals and is not the correct standard to apply to polyurethane foam products. There was industry based testimony that many other agencies don't regulate polyurethane foam as a hazardous material and as a result it should not be regulated by the International Building Code or International Fire Code as a hazardous material.

The National Association of State Fire Marshals and the Joint Fire Service Review Committee both objected to the specifics of the proposal based upon the application of the mattress test standard. The stated reason of those objections were that the referenced test standard applied to mattresses in use, i.e., the test dealt with single mattresses placed upon a frame for use as a bed. It did not address conditions where mattresses might be placed on edge, stacked or in storage. As worded the mattress standard was being misapplied. The National Association of State Fire Marshals (NASFM) believes that according to the current provisions of the International Building Code and International Fire Code, polyurethane foam is a flammable solid.

Considerable background information was provided directly to the Fire Code Committee prior to the hearings concerning the classification of poly urethane foam as a flammable solid along with a comparison to how the codes are applied to other consumer products that are classified as hazardous materials. None of the committee members challenged the veracity of that information. This information can be found at: http://www.firemarshals.org/mission/catastrophic/furniture-stores-andfurniture-warehouses/

The opponents correctly identified that regulating polyurethane foam as a hazardous material would have a wide impact on occupancies with many potentially being classified as H-3 Group occupancies. NASFM agrees with the potential impact. But NASFM does not agree that it is a legitimate reason to fail to correctly apply the code to a material that laboratory testing has identified as a flammable solid and that has been recognized as contributing significant fuel loads when fires occur.

Only five committee members spoke during committee deliberations. Two of those committee members clearly agreed with the classification of polyurethane foam as a flammable solid and the need for regulation addressing the hazard presented by the polyurethane foam products. One committee member stated that he did not believe he was not convinced that the polyurethane was a flammable solid and that he believed that the proposed language was misapplying the mattress test standard. One committee member repeated the assertions of industry representatives that the proposal was a backdoor attempt to bring polyurethane foam products into the code for regulation and was concerned about the effect on occupancies containing consumer products manufactured with polyurethane foam components. The fifth committee members stated that he believed the proposal was misapplying the test standard and that a proper test standard should be utilized.

None of the opponents or objecting committee members addressed the fact that as currently written, the definition for flammable solids found within the code clearly embraces the chemical properties of polyurethane foam as indicated in industry produced chemical safety MSDS for polyurethane foam and as verified by laboratory testing. The industry produces chemical safety MSDS for these products identifying the material as a "combustible solid" and listing the severe fire hazard the material presents and the fact that the material liquefies and burns in the same manner as a flammable liquid when involved in fire. There is no question concerning the fire hazard presented by polyurethane foam and consumer products containing polyurethane foam. Research and laboratory testing has verified these hazards over and over. The same industry representatives that testified against proposals G29-07/08 and F288-07/08 proposed F135-07/08, a proposal that would require any mercantile occupancy used primarily for the display and sale of upholstered furniture to be protected with an automatic sprinkler system regardless of size. In testifying the industry representatives stated they were doing so because they wanted to protect the public and emergency responders from the fire hazard presented by the presence of polyurethane foam products. The committee approved the proposal as modified by removing the word primarily so the requirement would apply regardless of how much upholstered furniture was present. Part of the committee reason for approving the motion was:

> *"The proposal was approved because the committee felt that it is a good first step supported by the furniture industry in attempting to deal with the hazards presented by upholstered furniture."*

The hazards presented by the upholstered furniture is due to the fact that polyurethane foam products are a flammable solid based upon descriptions contained within the chemical safety MSDS produced by polyurethane manufacturers, based upon the documented manner in which polyurethane reacts when exposed to sources of ignition and based upon laboratory testing. The committee's decision in F135-07/08 conflicts with its written reason for the decision in G29-07/08 and F288-07/08. Instead of sticking to the science and technical aspects of applying the code to the hazard presented it appears that some committee members allowed the potential effect on other occupancies of recognizing polyurethane foam as a flammable solid utilizing current code language.

This public comment to approve G29-07/08 and F288-07/08 as modified is intended to address several issues. It correctly applies the CPSC mattress standard by providing an exception for mattresses meeting the standard when positioned for use. The new wording limits the application of the standard to address testimony at the hearings and the decision of the committee. The modified language also builds upon the testimony of the industry representatives when F135-07/08 was considered by the committee and the statement of the committee that the
requirement for automatic fire sprinkler protection in mercantile occupancies was a good first step to addressing the fire hazard presented by polyurethane foam. It does this by providing an exception from the current code requirements concerning flammable solids for any occupancy protected by an automatic fire sprinkler system.

We note that no one has refuted the position that polyurethane foam presents a severe fire potential and that when involved in fire it endangers lives and occupancies. No one has refuted how readily polyurethane foam will burn when exposed to an ignition source and that even fire retardant treated polyurethane foam products will burn vigorously when exposed to a flame source. No one has proposed changing the definition of a flammable solid currently contained within the code, a definition that clearly applies to products that react the way polyurethane foam does when tested in accordance with the current standard.

IBC [F]307.2 Definitions

"FLAMMABLE SOLID. A solid, other than a blasting agent or explosive, that is capable of causing fire through friction, absorption or moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which has an ignition temperature below 212°F (100°C) or which burns so vigorously and persistently when ignited as to create a serious hazard. A chemical shall be considered a flammable solid as determined in accordance with the test method of CPSC 16 CFR; Part 1500.44, if it ignites and burns with a self-sustained flame at a rate greater than 0.1 inch (2.5 mm) per second along its major axis."

This public comment addresses a recognized fire and life safety hazard and provides an exception that many existing occupancies already meet, that most if not all newly constructed occupancies meet, and that any occupancy can meet by simply limiting the amount of polyurethane material that is present or by installing an automatic fire sprinkler system.

Final Action: AS AM AMPC____ D

F290-07/08

4001.1, 4006

Proposed Change as Submitted:

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

Revise as follows:

4001.1 (Supp) Scope. The storage and use of oxidizing materials shall be in accordance with this chapter and Chapter 27. Oxidizing gases shall also comply with Chapter 30. Oxidizing cryogenic fluids shall also comply with Chapter 32.

Exceptions:

1. Display and storage in Group M and storage in Group S occupancies complying with Section 2703.11.
2. Bulk oxygen systems at industrial and institutional consumer sites shall be in accordance with NFPA 55.
3. Liquid oxygen stored or used in home health care in Groups I-1, I-4 and R occupancies in accordance with Section 4006.

SECTION 4006 (Supp)
LIQUID OXYGEN IN HOME HEALTH CARE

4006.1 General. The storage and use of liquid oxygen (LOX) in home health care in Groups I-1, I-4 and R occupancies shall comply with Sections 4006.2 through 4006.~~3.7~~6, ~~as applicable~~ or shall be stored and used in accordance with Chapter 27.

4006.2 Information and instructions to be provided. The ~~supplier~~ seller of liquid oxygen shall provide the user with ~~the following~~ information in written form that includes, but is not limited to, the following:

1. Manufacturer's instructions and labeling for safe storage and use ~~operation~~ of the containers ~~used and labeling~~.
2. Locating containers away from ignition sources, exits, electrical hazards and high temperature devices in accordance with Section 4006.3.3.
3. Restraint of containers to prevent falling in accordance with Section 4006.3.4.
4. Requirements for ~~transporting~~ handling containers in accordance with Section 4006.3.5.
5. Safeguards for refilling containers in accordance with Section 4006.3.6~~to be followed when containers are refilled~~.
6. Signage requirements in accordance with Section 4006.6.

4006.3 Liquid oxygen home care containers. ~~Liquid oxygen home care and ambulatory containers in Groups I-1, I-4, R-3 Residential Care/Assisted Living Facilities and R-4 occupancies shall be stored, used and filled in accordance with Sections 4006, 3203.1 and 3203.2.~~ Containers of liquid oxygen in home health care shall be in accordance with Sections 4006.3.1 through 4006.3.6.

4006.3.1 Maximum individual container capacity. Liquid oxygen home care containers shall not exceed an individual capacity of 15.8 gal (60 liters) in Groups I-1, I-4, and R occupancies. Liquid oxygen ambulatory containers are allowed in Groups I-1, I-4, and R occupancies. Containers of liquid oxygen in home health care shall also be stored, used and filled in accordance with Sections 4006, 3203.1 and 3203.2.

~~**4006.3.1**~~ **4006.3.2 Manufacturer's instructions.** Containers shall be stored, used and operated in accordance with the manufacturer's instructions and labeling.

~~**4006.3.2**~~ **4006.3.3 Locating containers.** Containers shall not be located in areas:

1. Where they can be overturned due to operation of a door,
2. Where they are in the direct path of egress,
3. Subject to falling objects,
4. Where they may become part of an electrical circuit, or
5. Where open flames and high temperature devices can cause a hazard.

~~**4006.3.3 No smoking.** Smoking shall be prohibited in rooms or areas where liquid oxygen is in use.~~
~~**4006.3.4 Signs**. A sign stating "OXYGEN NO SMOKING" shall be posted in the room or area where the liquid oxygen home care container(s) is stored or used and liquid oxygen ambulatory containers are filled.~~

~~**4006.3.5**~~ **4006.3.4 Restraining containers.** Liquid oxygen home care containers shall be restrained while in storage or use to prevent falling caused by contact, vibration or seismic activity. Containers shall be restrained by one of the following methods:

1. Restraining containers to a fixed object with one or more restraints.
2. Restraining containers within a framework, stand or assembly designed to secure the container.
3. Restraining containers by locating a container against two points of contact like the walls of a corner of a room or a wall and a secure furnishing or object like a desk.

~~**4006.3.6**~~ **4006.3.5 Container ~~movement~~ handling.** Containers shall be ~~transported~~ handled by use of a cart or hand truck designed for such use.

Exceptions:

1. Liquid oxygen home care containers equipped with a roller base.
2. Liquid oxygen ambulatory containers are allowed to be hand carried.

~~**4006.3.7**~~ **4006.3.6 Filling of containers.** The filling of containers shall be in accordance with Sections ~~4006.3.7.1~~ 4006.3.6.1 through ~~4006.3.7.3~~ 4006.3.6.3.

~~**4006.3.7.1**~~ **4006.3.6.1 Filling location ~~of home care containers.~~** Liquid oxygen home care containers and ambulatory containers shall be filled outdoors.

Exception: Liquid oxygen ambulatory containers are allowed to be filled indoors if the supply container is specifically designed for filling such containers and written instructions are provided by the container manufacturer.

~~**4006.3.7.1.1**~~ **4006.3.6.2 Incompatible surfaces.** A ~~liquid oxygen compatible~~ drip pan compatible with liquid oxygen shall be provided under home care container fill and vent connections during the filling process in order to protect against liquid oxygen spillage from coming into contact with combustible surfaces, including asphalt.

~~**4006.3.7.2 Filling of ambulatory care containers.** The filling of liquid oxygen ambulatory containers is allowed indoors where the supply container is designed to fill them and written instructions are provided by the container manufacturer.~~

~~**4006.3.7.3**~~ **4006.3.6.3 Open flames and high temperature devices.** The use of open flames and high temperature devices shall be in accordance with Section 2703.7.2.

4006.4 Maximum aggregate quantity. The maximum aggregate quantity of liquid oxygen allowed in storage and in use in each dwelling unit shall be 31.6 gal (120 L).

Exceptions:

1. The maximum aggregate quantity of liquid oxygen allowed in Group I-4 occupancies shall be limited by the maximum allowable quantity set forth in Table 2703.1.1(1).
2. Where individual sleeping rooms are separated from the remainder of the dwelling unit by fire barriers and horizontal assemblies having a minimum fire-resistance rating of 1 hour in accordance with the *International Building Code*, the maximum aggregate quantity per dwelling unit can be increased to allow a maximum of 31.6 gal (120 L) of liquid oxygen per sleeping room.

4006.5 Smoking prohibited. Smoking shall be prohibited in rooms or areas where liquid oxygen is in use.

4006.6 Signs. Warning signs for occupancies using home health care liquid oxygen shall be in accordance with Sections 4006.6.1 and 4006.6.2.

4006.6.1 No smoking sign. A sign stating "OXYGEN--NO SMOKING" shall be posted in each room or area where liquid oxygen containers are stored, used or filled.

4006.6.2 Premises signage. Where required by the fire code official, each dwelling unit or sleeping unit shall have an approved sign indicating that the unit contains liquid oxygen home care containers.

4006.7 Fire department notification. Where required by the fire code official, the liquid oxygen seller shall notify the fire department of the locations of liquid oxygen home care containers.

Reason: Code change proposal F205-06/07 was accepted during the last code change cycle and is included in the 2007 Supplement. In reviewing this section with stakeholders including key industry representatives, the fire service, the fire fighter union and others, there are some changes that are still necessary to complete this subject. Included in this proposal are the consensus proposals from the discussions these groups held since the final action hearings for the 06/07 cycle.

It is not realistic to apply the MAQ/control area concept set forth in Chapter 27 to the widespread use and distribution of liquid oxygen in home health care occupancies. This proposal adds a third exception to clarify that liquid oxygen that is stored and used in home health care occupancies in accordance with Section 4006 is not required to also comply with Chapter 27 or Chapter 32 provisions. The concept in Section 4006 is to limit the individual container size and also limit the total number of containers allowed in an individual dwelling unit. Trying to further regulate the quantity in a building is not considered by either industry or the fire service to be a reasonable or enforceable regulatory approach.

This proposal accomplishes several important things:

1. It establishes a maximum capacity for individual containers of liquid oxygen (LOX) that can be stored and used in home health care occupancies. It is necessary to establish such a limit because there has been a trend to increase the size of the containers delivered to the user in some cases simply in order to avoid more frequently deliveries. If it is necessary to have individual containers larger than the limits established here, then the MAQ and control area concept set forth in Chapter 27 will apply.
2. It eliminates the direct reference to R-3 Residential Care and R-4 occupancies and more appropriately applies to all R occupancies, including single-family residences, hotels and apartments used for home health care.
3. It clarifies that it is the responsibility of the seller rather than the supplier of liquid oxygen to provide the user with important safety information as the supplier may not be the entity that has the direct contact with the user.

This change allows the fire code official to require signage for each dwelling unit or sleeping unit when the fire department deems it necessary to alert the fire fighters of the presence of LOX in a home. Using the term "when required by the fire code official" allows the fire department to require signage if that signage is part of their operational plans.

This change allows the fire code official to require the seller of LOX to notify the fire department if that fire department wants to track the locations of LOX within their jurisdiction. Some fire departments want to know where the LOX locations are so they can pre-plan those locations. Other fire departments do not want this information due to the potentially large amount of information and do not have the resources to process that information. This proposal uses the term "when required by the fire code official" to give that option to both the fire departments that want to track the information and those who do not want to track it.

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

Committee Action: **Approved as Submitted**

Committee Reason: The proposal was approved because the committee felt that it reflects a consensus of concerned parties that responded to committee input in the last cycle and provides improved regulation of home oxygen use. Concern was expressed, however, that Sections 4006.6.2 and 4006.7 could be viewed as breach of privacy issues and could be in violation of HIPPA rules for patient medical confidentiality.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment 1:

Larry Fluer, Fluer, Inc., representing Compressed Gas Association, requests Approval as Modified by this public comment.

Modify proposal as follows:

~~**4006.7 Fire department notification.** Where required by the fire code official, the liquid oxygen seller shall notify the fire department of the locations of liquid oxygen home care containers.~~

(Portions of proposal not shown remain unchanged.)

Commenter's Reason: Oxygen provided for patient care is a drug under the requirements of the US FDA. The supplier of oxygen is a Health Care Provider as regulated by The Health Insurance Portability and Accountability Act of 1996 (HIPAA), Public Law 104-191, enacted on August 21, 1996.

The *Standards for Privacy of Individually Identifiable Health Information* ("Privacy Rule") published by the US Department of Health and Human Services establishes a set of national standards for the protection of certain health information. The U.S. Department of Health and Human Services ("HHS") issued the Privacy Rule to implement the requirement of the Health Insurance Portability and Accountability Act of 1996 ("HIPAA"). A summary of the rule can be found at the following HHS website: http://www.hhs.gov/ocr/privacysummary.pdf

The following sections excerpted from the HHS Summary, are of interest:

> Within the department of Health and Human Services, the Office for Civil Rights (OCR) has responsibility for implementing and enforcing the Privacy Rule with respect to voluntary compliance activities and civil money penalties. A major goal of the Privacy Rule is to assure that individuals' health information is properly protected while allowing the flow of health information needed to provide and promote high quality health care and to protect the public's health and well being.
>
> Individually indentifiable health information held or transmitted in any form, whether electronic, paper or oral is under the protection of HIPAA. Individually identifiable health information is information, including demographic data, that relates to:
>
> - The individual's past, present or future physical or mental health or condition,
> - The provision of health care to the individual, or
> - The past, present, or future payment for the provision of health care to the individual,
>
> and that identifies the individual or for which there is a reasonable basis to believe can be used to identify the individual. Individually identifiable health information includes many common identifiers, e.g., name, address [underlining for emphasis], birth date, Social Security Number.

Disclosure of certain protected information can be permitted with written authorization of the individual, and with limitations without an individual's authorization. For example, the supplier can disclose protected health information to law enforcement officials for law enforcement purposes under a limited number of circumstances and subject to specified conditions e.g., to identify or locate a suspect, fugitive, material witness, or missing person.

Legal opinion provided by a major supplier of LOX for medical purposes is it is within the purview of the code to establish a requirement for notification; however, once adopted into law and information is provided to the jurisdiction (a legal entity), responsibility for maintaining confidentiality under the requirements of HIPAA falls to the jurisdiction. By providing such information to the jurisdiction, the seller will have complied with the law.

The preferable assumption to be taken by emergency response personnel may be to consider that any occupancy including residential occupancies could contain LPG, LOX, black powder, or any of a variety of hazardous materials.

Public Comment 2:

Larry Fluer, Fluer, Inc., representing Compressed Gas Association, requests Approval as Modified by this public comment.

Modify proposal as follows:

~~**4006.6.2 Premises signage.** Where required by the fire code official, each dwelling unit or sleeping unit shall have an approved sign indicating that the unit contains liquid oxygen home care containers.~~

(Portions of proposal not shown remain unchanged.)

Commenter's Reason: The broadening of the requirements for the application of Section 4006.1 to include all R occupancies raises a question regarding residential occupancies that may be regulated under the IRC. The establishment of general safety rules that are within the reach of the seller are the most effective. For example, providing operating instructions, labeling, and warnings to avoid ignition sources are part of the routine that has been a practice of the industry engaged in the supply of such materials. The code has now been broadened to limit the maximum number of containers, their restraint, restrictions on filling locations and other safeguards which are able to be addressed within the context of convention. On the other hand, demands on both the health care system and local government that create an administrative burden for both the jurisdiction and the health care provider through the use of requirements for premises identification may not be realistic.

Although it is noted that the use of the provision for premises notification in 4006.6.2 is at the option of the code official, there are several problems with its application which require further consideration before the requirement is established. The requirements for premises signage, as well as fire department notification (4006.7), present challenges for the enforcement community and code users alike by raising questions without ready answers. For example:

- Just what oversight of owner-occupied one-and two-family dwellings by the local fire department is open to question.
- How will a patient's right to privacy be honored while at the same time providing notification to emergency responders of the presence of medical oxygen?
- If a patient does not provide the seller with consent to notify the code official or to post such signage how will the law be enforced?
- Even if a sign is provided to the user by the seller (and there is no requirement in the code for the seller do so), who has the actual responsibility for placement of such a sign on the users premises? The local fire department may lack the administrative capacity to monitor whether or not the signs are being placed as required.
- How will local fire departments enforce signage removal requirements when the oxygen is removed, or when the patient vacates the premises?
- Even if the regulations do allow for local enforcement in R-3 occupancies (in those jurisdictions not using the IRC), such a requirement could be considered an unfunded state mandate/state pay program.
- What requirements must be met to achieve "approval" for premises signage? A sign or label could be developed that allows trained emergency responders to recognize the label or sign by its general appearance, however, as a means to protect patient privacy the sign or label would not be publicized for security reasons. This could result in a wide array of signs and sign types being required in a relatively small area in densely populated communities with multiple jurisdictions in close proximity.
- How are the signage requirements to be applied in transient occupancies such as the R-1?

As one committee member noted during the code development hearings, there are no requirements to post residential uses with signs or labels indicating the presence of LPG containers, nor are there requirements to post such uses to notify of the presence of any number of hazards including those involving hazardous substances other than compressed gases. A warning sign could be required for any number of hazards, but it may be that the better default condition for emergency response would be to assume that oxidizing gases could be present.

An accurate number of people using home oxygen therapy is uncertain. A 2006 study conducted for the American Association for Homecare, noted that more than 1 million Medicare recipients use oxygen therapy.[1] Combining this figure with known insurance company information, results in some researchers projecting an estimate that there are roughly two million people using home oxygen therapy. The use is predicted to grow as the population ages.

Establishing requirements for premises signage in the code is premature. There are a number of unanswered questions raised for the code official, the sellers and the users that must be answered before the provision for premises signage can function as envisioned. The provision should not be included until such time as solutions have been developed to answer the questions surrounding the rights of patient's privacy along with a means to resolve the problems created for code enforcement.

[1] *A Comprehensive Cost Analysis of Medicare Home Oxygen Therapy: A Study for the American Association for Homecare*, Morrison Informatics, Inc., June 27, 2006, p.2.

Final Action: AS AM AMPC____ D

F291-07/08
4002.1 (IBC 307.2)

Proposed Change as Submitted:

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing Arch Chemicals, Inc., and PPG Industries, Inc.

Revise definition as follows:

4002.1 (IBC 307.2) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

OXIDIZER. A material that readily yields oxygen or other oxidizing gas, or that readily reacts to promote or initiate combustion of combustible materials and, if heated or contaminated, can result in vigorous self-sustained decomposition ~~Examples of other oxidizing gases include bromine, chlorine and fluorine.~~

Class 4. An oxidizer that can undergo an explosive reaction due to contamination or exposure to thermal or physical shock and that causes a severe increase in the burning rate of combustible materials with which it comes into contact. In addition, the oxidizer ~~will enhance~~ causes a severe increase in the burning rate and can cause spontaneous ignition of combustibles.

Class 3. An oxidizer that ~~will~~ causes a severe increase in the burning rate of combustible materials with which it comes in contact ~~or that will undergo vigorous self-sustained decomposition caused by contamination or exposure to heat~~.

Class 2. An oxidizer that will cause a moderate increase in the burning rate ~~or that causes spontaneous ignition~~ of combustible materials with which it comes in contact.

Class 1. An oxidizer that does not moderately increase the burning rate of ~~whose primary hazard is that it slightly increases the burning rate but which does not cause spontaneous ignition when it comes in contact with~~ combustible materials.

Reason: This proposal updates the IFC (IBC) definition of oxidizer to be consistent with the current definition of an oxidizer. The definition of an oxidizer in the IFC (IBC) is based on the definition in the Uniform Fire Code which came from NFPA 430.

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

Committee Action: **Approved as Submitted**

Committee Reason: The proposal was approved because the committee felt that it provides an appropriate update to the definition oxidizer consistent with OSHA regulations and NFPA 40.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

George Verbryck, Alert Corp., representing Spa and Pool Chemical Manufacturer's Association, requests Disapproval.

Commenter's Reason: This proposal was approved as submitted by the Committee ".... because the committee felt that it provides an appropriate update to the definition oxidizer consistent with OSHA regulations and NFPA 40." The proposed definition is inconsistent with OSHA regulations. NFPA 40 addresses nitrate film, not oxidizers. Specifically, the proposal is inconsistent with the OSHA definition of oxidizer at 29 CFR §1910.1200 (c) which provides as follows: "Oxidizer means a chemical other than a blasting agent or explosive as defined in sec. 1910.109(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases."

The proposed definition is also inconsistent with the examples of Classes I - IV oxidizers in §E102.1.7.1, "Examples of Liquid and Solid Oxidizers According to Hazard, " in Appendix E. In particular, potassium percarbonate, potassium persulfate, sodium dichloro-striazinetrione dihydrate, sodium perborate (anhydrous), sodium perborate monohydrate, sodium perborate tetrahydrate, sodium percarbonate, and sodium persulfate, currently listed as Class 1 Oxidizers in the Appendix, may not meet the criteria for Class 1 Oxidizers in the proposed definition of oxidizer, i.e., would not be classified as "oxidizers" under the proposed definition. No evidence was presented to the committee by the proponent that the examples of Classes I - IV oxidizers in Appendix E were evaluated or reevaluated in light of the proposed new definition of oxidizer.

The proposal is also inconsistent with the definition of oxidizer in DOT regulations at 49 CFR §173.127 (a) and (b). DOT regulations define three groups or "classes" of solid and liquid oxidizers in accordance with test procedures in the UN Manual of Tests and Criteria. Flammable liquids are classified in the Fire Code in accordance with flash points. In a similar manner DOT classifies solid oxidizers in accordance with a burning rate and liquid oxidizers in accordance with the pressure rise time of a chemical mixture. These are exacting criteria.

The proposed definition in Code Change F-291 07/08 defines Classes I - IV oxidizers with inexact terms "... and if heated or contaminated can result in a vigorous self sustained decomposition ...," "... and if heated or contaminated can result in a severe increase in the burning rate of combustible materials with which it comes in contact ...," "... causes a severe increase... ," and "... that does not moderately increase the burning rate of ..." Such inexact descriptors are subject to various interpretations by different individuals, jurisdictions, and organizations. Moreover, the descriptors appear to apply only to solid oxidizers.

Consideration should be given in the next code change cycle to the development of a definition of oxidizer consistent with OSHA and DOT regulations. and to reevaluate the examples of Classes I-IV oxidizers in Appendix E consistent with that definition.

Bibliography

F291-07/08, ICC Public Hearing February 2008, pages F267-8.
F291-07/08, 2008 ICC Public Hearing Results, page 278.
49 CFR §173.127 (a) and (b), (Electronic Code of Federal Regulations, June 4, 2008
29 CFR §1910.1200 (c), "Hazard Communication"
§E102.1.7.1,"Examples of Liquid and Solid Oxidizers," 2007 California Fire Code, pages 532f.

Final Action: AS AM AMPC____ D

F294-07/08

Chapter 46 (New), 102.1, 202, 607.1, 701.1, 704.1, Table 704.1, 903.6.1, 905.11, 907.3 through 907.3.4.3, 1027, 2506.1

Proposed Change as Submitted:

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

1. Add new chapter as follows:

CHAPTER 46
CONSTRUCTION REQUIREMENTS FOR EXISTING BUILDINGS

SECTION 4601
GENERAL

4601.1Scope. The provisions of this chapter shall apply to existing buildings constructed prior to the adoption of this code.

4601.2 Intent. The intent of this chapter is to provide a reasonable degree of fire and life safety to persons occupying existing buildings by providing for alterations to such existing buildings which do not comply with the minimum requirements of the *International Building Code*.

4601.3 Permits. Permits shall be required as set forth in Section 105.7 and the *International Building Code*.

4601.4 Owner Notification. Where a building is found to be in non-compliance, the fire code official shall duly notify the owner of the building. Upon receipt of such notice, the owner shall, subject to the following time limits, take necessary actions to comply with the provisions of Chapter 46.

4601.4.1 Plans and specifications. Plans and specifications for the necessary alterations shall be completed within a time schedule approved by the fire code official.

4601.4.2 Completion of work. Work on the required alterations to the building shall be completed within a time schedule approved by the fire code official.

4601.4.3 Extension of time. The fire code official is authorized to grant necessary extensions of time when it can be shown that the specified time periods are not physically practical or pose an undue hardship. The granting of an extension of time for compliance shall be based on the showing of good cause and subject to the filing of an acceptable systematic plan of correction with the fire code official.

SECTION 4602
DEFINITIONS

4602.1 Definition. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

EXISTING. Buildings, facilities or conditions which are already in existence, constructed or officially authorized prior to the adoption of this code.

SECTION 4603
FIRE SAFETY REQUIREMENTS FOR BUILDINGS

4603.1 Required modifications. Means of egress in existing buildings shall comply with the requirements of Section 1027 and the building code that applied at the time of construction. Where these provisions conflict, the most restrictive provision shall apply.

For existing buildings that were not required to comply with a building code at the time of construction, such buildings shall comply with the requirements of Section 1027 and, in addition, shall have a life safety evaluation prepared, consistent with the requirements of Section 104.7.2. The life safety evaluation shall identify any changes to the means of egress that are necessary to provide safe egress to occupants and shall be subject to review and approval by the fire code official. The building shall be modified to comply with the recommendations set forth in the approved evaluation.

Exception: Group U Occupancies do not need to comply.

4603.2 Elevator Operation. Existing elevators with a travel distance of 25 feet (7620 mm) or more above or below the main floor or other level of a building and intended to serve the needs of emergency personnel for fire-fighting or rescue purposes shall be provided with emergency operation in accordance with ASME A17.3.

4603.3 Vertical openings. Interior vertical shafts, including but not limited to stairways, elevator hoistways, service and utility shafts, that connect two or more stories of a building shall be enclosed or protected as specified in Sections 4603.3.1 through 4603.3.7.

4603.3.1 Group I occupancies. In Group I occupancies, interior vertical openings connecting two stories or more shall be protected with 1- hour fire-resistance-rated construction.

4603.3.2 Three to five stories. In other than Group I occupancies, interior vertical openings, other than escalators, connecting three to five stories shall be protected by either 1-hour fire-resistance-rated construction or an automatic sprinkler system shall be installed throughout the building in accordance with Sections 903.3.1.1 or 903.3.1.2.

Exceptions:

1. Vertical opening protection is not required for Group R-3 occupancies.
2. Vertical opening protection is not required for open parking garages and ramps.

4603.3.3 More than five stories. In other than Group I occupancies, interior vertical openings, other than escalators, connecting more than five stories shall be protected by 1- hour fire-resistance-rated construction.

Exceptions:

1. Vertical opening protection is not required for Group R-3 occupancies.
2. Vertical opening protection is not required for open parking garages and ramps.

4603.3.4 Atriums and covered malls. In other than Group I occupancies, interior vertical openings in a covered mall building or a building with an atrium shall be protected by either 1- hour fire-resistance-rated construction or an automatic sprinkler system shall be installed throughout the building in accordance with Sections 903.3.1.1 or 903.3.1.2.

Exceptions:

1. Vertical opening protection is not required for Group R-3 occupancies.
2. Vertical opening protection is not required for open parking garages and ramps.

4603.3.5 Escalators in Group B and M occupancies. Escalators creating vertical openings connecting any number of stories shall be protected by either 1- hour fire-resistance-rated construction or an automatic fire sprinkler system in accordance with Section 903.3.1.1 installed throughout the building, with a draft curtain and closely spaced sprinklers around the escalator opening.

4603.3.6 Escalators connecting less than four stories. In other than Group B and M occupancies, escalators creating vertical openings connecting less than four stories shall be protected by either 1- hour fire-resistance-rated construction or an automatic sprinkler system in accordance with Sections 903.3.1.1 or 903.3.1.2 shall be installed throughout the building, and a draft curtain with closely spaced sprinklers shall be installed around the escalator opening.

4603.3.7 Escalators connecting more than four stories. In other than Group B and M occupancies, escalators creating vertical openings connecting five or more stories shall be protected by 1- hour fire-resistance-rated construction.

4603.4 Sprinkler systems. An automatic sprinkler system shall be provided in all existing buildings where cellulose nitrate film or pyroxylin plastics are manufactured, stored or handled in quantities exceeding 100 pounds (45 kg). Vaults located within buildings for the storage of raw pyroxylin shall be protected with an approved automatic sprinkler system capable of discharging 1.66 gallons per minute per square foot (68 $L/min/m^2$) over the area of the vault.

4603.5 Standpipes. Existing structures with occupied floors located more than 50 feet (15 240 mm) above or below the lowest level of fire department access shall be equipped with standpipes installed in accordance with Section 905. The standpipes shall have an approved fire department connection with hose connections at each floor level above or below the lowest level of fire department access. The fire code official is authorized to approve the installation of manual standpipe systems to achieve compliance with this section where the responding fire department is capable of providing the required hose flow at the highest standpipe outlet.

4603.6 Fire alarm systems. An approved manual, automatic or manual and automatic fire alarm system shall be installed in existing buildings and structures in accordance with Sections 4603.6.1 through 4603.6.7 and provide occupant notification in accordance with Section 907.6 unless other requirements are provided by other sections of this code.

Exception: Occupancies with an existing, previously approved fire alarm system.

4603.6.1 Group E. A fire alarm system shall be installed in existing Group E occupancies in accordance with Section 907.2.3.

Exceptions:

1. A manual fire alarm system is not required in a building with a maximum area of 1,000 square feet (93 m^2) that contains a single classroom and is located no closer than 50 feet (15 240 mm) from another building.
2. A manual fire alarm system is not required in Group E with an occupant load less than 50.

4603.6.2 Group I-1. An automatic or manual fire alarm system shall be installed in existing Group I-1 residential care/assisted living facilities in accordance with Section 907.2.6.1.

Exceptions:

1. Manual fire alarm boxes in resident or patient sleeping areas shall not be required at exits if located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.5.2 are not exceeded.
2. Where each sleeping room has a means of egress door opening directly to an exterior egress balcony that leads directly to the exits in accordance with Section 1014.5, and the building is not more than three stories in height.

4603.6.3 Group I-2. An automatic or manual fire alarm system shall be installed in existing Group I-2 occupancies in accordance with Section 907.2.6.2.

Exception: Manual fire alarm boxes in resident or patient sleeping areas shall not be required at exits if located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.5.2 are not exceeded.

4603.6.4 Group I-3. An automatic or manual fire alarm system shall be installed in existing Group I-3 occupancies in accordance with Section 907.2.6.3.

4603.6.5 Group R-1. A fire alarm system and smoke alarms shall be installed in existing Group R-1 occupancies in accordance with Sections 4603.6.5.1 through 4603.6.5.2.

4603.6.5.1 Group R-1 hotels and motels. An automatic or manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-1 hotels and motels more than three stories or with more than 20 sleeping units.

Exception: Buildings less than two stories in height where all sleeping units, attics and crawl spaces are separated by 1-hour fire-resistance-rated construction and each sleeping unit has direct access to a public way, exit court or yard.

4603.6.5.2 Group R-1 boarding and rooming houses. An automatic or manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-1 boarding and rooming houses.

Exception: Buildings that have single-station smoke alarms meeting or exceeding the requirements of Section 907.2.10.1 and where the fire alarm system includes at least one manual fire alarm box per floor arranged to initiate the alarm.

4603.6.6 Group R-2. An automatic or manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-2 occupancies more than three stories in height or with more than 16 dwelling units or sleeping units.

Exceptions:

1. Where each living unit is separated from other contiguous living units by fire barriers having a fire-resistance rating of not less than 0.75 hour, and where each living unit has either its own independent exit or its own independent stairway or ramp discharging at grade.
2. A separate fire alarm system is not required in buildings that are equipped throughout with an approved supervised automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and having a local alarm to notify all occupants.
3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with Section 1023.6, Exception 4.

4603.6.7 Group R-4. An automatic or manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-4 residential care/assisted living facilities.

Exceptions:

1. Where there are interconnected smoke alarms meeting the requirements of Section 907.2.10 and there is at least one manual fire alarm box per floor arranged to sound continuously the smoke alarms.
2. Other manually activated, continuously sounding alarms approved by the fire code official.

4603.7 Single- and multiple-station smoke alarms. Single- and multiple-station smoke alarms shall be installed in existing Group R occupancies in accordance with Sections 4603.7.1 through 4603.7.3.

4603.7.1 Where required. Existing Group R occupancies not already provided with single-station smoke alarms shall be provided with single-station smoke alarms. Installation shall be in accordance with Section 907.2.10, except as provided in Sections 4603.7.2 and 4603.7.3.

4603.7.2 Interconnection. Where more than one smoke alarm is required to be installed within an individual dwelling unit or sleeping unit in Group R-1, R-2, R-3 or R-4, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

Exceptions:

1. Interconnection is not required in buildings that are not undergoing alterations, repairs or construction of any kind.
2. Smoke alarms in existing areas are not required to be interconnected where alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for interconnection without the removal of interior finishes.

4603.7.3 Power source. In Group R occupancies, single-station smoke alarms shall receive their primary power from the building wiring provided that such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery back-up shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exception: Smoke alarms are permitted to be solely battery operated: in existing buildings where no construction is taking place; in buildings that are not served from a commercial power source; and in existing areas of buildings undergoing alterations or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for building wiring without the removal of interior finishes.

SECTION 4604
MEANS OF EGRESS FOR EXISTING BUILDINGS

4604.1 General. Means of egress in existing buildings shall comply with the minimum egress requirements when specified in Table 4604.1 as further enumerated in Sections 4604.2 through 4604.21, and the building code that applied at the time of construction. Where the provisions conflict, the most restrictive provision shall apply. Existing buildings that were not required to comply with a building code at the time of construction shall comply with the minimum egress requirements when specified in Table 4603.1 as further enumerated in Sections 4604.2 through 4604.21, and, in addition, shall have a life safety evaluation prepared, consistent with the requirements of Section 104.7.2. The life safety evaluation shall identify any changes to the means of egress that are necessary to provide safe egress to occupants and shall be subject to review and approval by the fire code official. The building shall be modified to comply with the recommendations set forth in the approved evaluation.

4604.2 Elevators, escalators and moving walks. Elevators, escalators and moving walks shall not be used as a component of a required means of egress.

Exceptions:

1. Elevators used as an accessible means of egress where allowed by Section 1007.4.
2. Previously approved escalators and moving walks in existing buildings.

4604.3 Exit sign illumination. Exit signs shall be internally or externally illuminated. The face of an exit sign illuminated from an external source, shall have an intensity of not less than 5 foot-candles (54 lux). Internally illuminated signs shall provide equivalent luminance and be listed for the purpose.

Exception: Approved self-luminous signs that provide evenly illuminated letters shall have a minimum luminance of 0.06 foot-lamberts (0.21 cd/m^2).

4604.4 Power source. Where emergency illumination is required in Section 4604.5, exit signs shall be visible under emergency illumination conditions.

Exception: Approved signs that provide continuous illumination independent of external power sources are not required to be connected to an emergency electrical system.

4604.5 Illumination emergency power. The power supply for means of egress illumination shall normally be provided by the premises' electrical supply. In the event of power supply failure, illumination shall be automatically provided from an emergency system for the following occupancies where such occupancies require two or more means of egress:

1. Group A having 50 or more occupants.

   Exception: Assembly occupancies used exclusively as a place of worship and having an occupant load of less than 300.

2. Group B buildings three or more stories in height, buildings with 100 or more occupants above or below the level of exit discharge, or buildings with 1,000 or more total occupants.
3. Group E in interior stairs, corridors, windowless areas with student occupancy, shops and laboratories.
4. Group F having more than 100 occupants.

   Exception: Buildings used only during daylight hours which are provided with windows for natural light in accordance with the *International Building Code*.

5. Group I.
6. Group M.

   Exception: Buildings less than 3,000 square feet (279 m^2) in gross sales area on one story only, excluding mezzanines.

7. Group R-1.

   Exception: Where each sleeping unit has direct access to the outside of the building at grade.

8. Group R-2.

   Exception: Where each dwelling unit or sleeping unit has direct access to the outside of the building at grade.

9. Group R-4.

   Exception: Where each sleeping unit has direct access to the outside of the building at ground level. The emergency power system shall provide power for not less than 60 minutes and consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 604.

4604.6 Guards. Guards complying with this section shall be provided at the open sides of means of egress that are more than 30 inches (762 mm) above the floor or grade below.

4604.6.1 Height of guards. Guards shall form a protective barrier not less than 42 inches (1067 mm) high.

Exceptions:

1. Existing guards on the open side of stairs shall be not less than 30 inches (760 mm) high.
2. Existing guards within dwelling units shall be not less than 36 inches (910 mm) high.
3. Existing guards in assembly seating areas.

4604.6.2 Opening limitations. Open guards shall have balusters or ornamental patterns such that a 6-inch diameter (152 mm) sphere cannot pass through any opening up to a height of 34 inches (864 mm).

Exceptions:

1 At elevated walking surfaces for access to, and use of electrical, mechanical or plumbing systems or equipment, guards shall have balusters or be of solid materials such that a sphere with a diameter of 21 inches (533 mm) cannot pass through any opening.
2. In occupancies in Group I-3, F, H or S, the clear distance between intermediate rails measured at right angles to the rails shall not exceed 21 inches (533 mm).
3. Approved existing open guards.

4604.7 Size of doors. The minimum width of each door opening shall be sufficient for the occupant load thereof and shall provide a clear width of not less than 28 inches (711 mm). Where this section requires a minimum clear width of 28 inches (711 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a clear opening width of 28 inches (711 mm). The maximum width of a swinging door leaf shall be 48 inches (1219 mm) nominal. Means of egress doors in an occupancy in Group I-2 used for the movement of beds shall provide a clear width not less than 41.5 inches (1054 mm). The height of doors shall not be less than 80 inches (2032 mm).

Exceptions:

1. The minimum and maximum width shall not apply to door openings that are not part of the required means of egress in occupancies in Groups R-2 and R-3.
2. Door openings to storage closets less than 10 square feet (0.93 m^2) in area shall not be limited by the minimum width.
3. Width of door leafs in revolving doors that comply with Section 1008.1.3.1 shall not be limited.
4. Door openings within a dwelling unit shall not be less than 78 inches (1981 mm) in height.
5. Exterior door openings in dwelling units, other than the required exit door, shall not be less than 76 inches (1930 mm) in height.
6. Exit access doors serving a room not larger than 70 square feet (6.5 m^2) shall be not less than 24 inches (610 mm) in door width.

4604.8 Opening force for doors. The opening force for interior side-swinging doors without closers shall not exceed a 5-pound (22 N) force. For other side-swinging, sliding and folding doors, the door latch shall release when subjected to a force of not more than 15 pounds (66 N). The door shall be set in motion when subjected to a force not exceeding a 30-pound (133 N) force. The door shall swing to a full-open position when subjected to a force of not more than 50 pounds (222 N). Forces shall be applied to the latch side.

4604.9 Revolving doors. Revolving doors shall comply with the following:

1. A revolving door shall not be located within 10 feet (3048 mm) of the foot or top of stairs or escalators. A dispersal area shall be provided between the stairs or escalators and the revolving doors.
2. The revolutions per minute for a revolving door shall not exceed those shown in Table 4604.9.

3. Each revolving door shall have a conforming side-hinged swinging door in the same wall as the revolving door and within 10 feet (3048 mm).

Exceptions:

1. A revolving door is permitted to be used without an adjacent swinging door for street floor elevator lobbies provided a stairway, escalator or door from other parts of the building does not discharge through the lobby and the lobby does not have any occupancy or use other than as a means of travel between elevators and a street.
2. Existing revolving doors where the number of revolving doors does not exceed the number of swinging doors within 20 feet (6096 mm).

TABLE 4604.9
REVOLVING DOOR SPEEDS

INSIDE DIAMETER	POWER-DRIVEN-TYPE SPEED CONTROL (RPM)	MANUAL-TYPE SPEED CONTROL (RPM)
6' 6"	11	12
7' 0"	10	11
7' 6"	9	11
8' 0"	9	10
8' 6"	8	9
9' 0"	8	9
9' 6"	7	8
10' 0"	7	8

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

4604.9.1 Egress component. A revolving door used as a component of a means of egress shall comply with Section 4604.9 and all of the following conditions:

1. Revolving doors shall not be given credit for more than 50 percent of the required egress capacity.
2. Each revolving door shall be credited with not more than a 50-person capacity.
3. Revolving doors shall be capable of being collapsed when a force of not more than 130 pounds (578 N) is applied within 3 inches (76 mm) of the outer edge of a wing.

4604.10 Stair dimensions for existing stairs. Existing stairs in buildings shall be permitted to remain if the rise does not exceed 8.25 inches (210 mm) and the run is not less than 9 inches (229 mm). Existing stairs can be rebuilt.

Exception: Other stairs approved by the fire code official.

4604.10.1 Stair dimensions for replacement stairs. The replacement of an existing stairway in a structure shall not be required to comply with the new stairway requirements of Section 1009 where the existing space and construction will not allow a reduction in pitch or slope.

4604.11 Winders. Existing winders shall be allowed to remain in use if they have a minimum tread depth of 6 inches (152 mm) and a minimum tread depth of 9 inches (229 mm) at a point 12 inches (305 mm) from the narrowest edge.

4604.12 Circular stairways. Existing circular stairs shall be allowed to continue in use provided the minimum depth of tread is 10 inches (254 mm) and the smallest radius shall not be less than twice the width of the stairway.

4604.13 Stairway handrails. Stairways shall have handrails on at least one side. Handrails shall be located so that all portions of the stairway width required for egress capacity are within 44 inches (1118 mm) of a handrail.

Exception: Aisle stairs provided with a center handrail are not required to have additional handrails.

4604.13.1 Height. Handrail height, measured above stair tread nosings, shall be uniform, not less than 30 inches (762 mm) and not more than 42 inches (1067 mm).

4604.14 Slope of ramps. Ramp runs utilized as part of a means of egress shall have a running slope not steeper than one unit vertical in ten units horizontal (10-percent slope). The slope of other ramps shall not be steeper than one unit vertical in eight units horizontal (12.5-percent slope).

4604.15 Width of ramps. Existing ramps are permitted to have a minimum width of 30 inches (762 mm) but not less than the width required for the number of occupants served as determined by Section 1005.1.

4604.16 Fire escape stairs. Fire escape stairs shall comply with Sections 4604.16.1 through 4604.16.7.

4604.16.1 Existing means of egress. Fire escape stairs shall be permitted in existing buildings but shall not constitute more than 50 percent of the required exit capacity.

4604.16.2 Protection of openings. Openings within 10 feet (3048 mm) of fire escape stairs shall be protected by fire door assemblies having a minimum ¾-hour fire-resistance rating.

Exception: In buildings equipped throughout with an approved automatic sprinkler system, opening protection is not required.

4604.16.3 Dimensions. Fire escape stairs shall meet the minimum width, capacity, riser height and tread depth as specified in Section 4604.10.

4604.16.4 Access. Access to a fire escape from a corridor shall not be through an intervening room. Access to a fire escape stair shall be from a door or window meeting the criteria of Table 1005.1. Access to a fire escape stair shall be directly to a balcony, landing or platform. These shall be no higher than the floor or window sill level and no lower than 8 inches (203 mm) below the floor level or 18 inches (457 mm) below the window sill.

4604.16.5 Materials and strength. Components of fire escape stairs shall be constructed of noncombustible materials. Fire escape stairs and balconies shall support the dead load plus a live load of not less than 100 pounds per square foot (4.78 kN/m^2). Fire escape stairs and balconies shall be provided with a top and intermediate handrail on each side. The fire code official is authorized to require testing or other satisfactory evidence that an existing fire escape stair meets the requirements of this section.

4604.16.6 Termination. The lowest balcony shall not be more than 18 feet (5486 mm) from the ground. Fire escape stairs shall extend to the ground or be provided with counterbalanced stairs reaching the ground.

Exception: For fire escape stairs serving 10 or fewer occupants, an approved fire escape ladder is allowed to serve as the termination for a fire escape stairs.

4604.16.7 Maintenance. Fire escapes shall be kept clear and unobstructed at all times and shall be maintained in good working order.

4604.17 Corridors. Corridors serving an occupant load greater than 30 and the openings therein shall provide an effective barrier to resist the movement of smoke. Transoms, louvers, doors and other openings shall be closed or be self-closing.

Exceptions:

1. Corridors in occupancies other than in Group H, which are equipped throughout with an approved automatic sprinkler system.
2. Patient room doors in corridors in occupancies in Group I-2 where smoke barriers are provided in accordance with the International Building Code.
3. Corridors in occupancies in Group E where each room utilized for instruction or assembly has at least one-half of the required means of egress doors opening directly to the exterior of the building at ground level.
4. Corridors that are in accordance with the *International Building Code*.

4604.17.1 Corridor openings. Openings in corridor walls shall comply with the requirements of the *International Building Code*.

Exceptions:

1. Where 20-minute fire door assemblies are required, solid wood doors at least 1.75 inches (44 mm) thick or insulated steel doors are allowed.
2. Openings protected with fixed wire glass set in steel frames.
3. Openings covered with 0.5-inch (12.7 mm) gypsum wallboard or 0.75-inch (19.1 mm) plywood on the room side.
4. Opening protection is not required when the building is equipped throughout with an approved automatic sprinkler system.

4604.17.2 Dead ends. Where more than one exit or exit access doorway is required, the exit access shall be arranged such that dead ends do not exceed the limits specified in Table 4604.17.2.

Exception: A dead-end passageway or corridor shall not be limited in length where the length of the dead-end passageway or corridor is less than 2.5 times the least width of the dead-end passageway or corridor.

TABLE 4604.17.2
COMMON PATH, DEAD-END AND TRAVEL DISTANCE LIMITS (by occupancy)

Occupancy	Common Path Limit		Dead-End Limit		Travel Distance Limit	
	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)
Group A	20/75[a]	20/75[a]	20[b]	20[b]	200	250
Group B	75	100	50	50	200	250
Group E	75	75	20	20	200	250
Group F-1,S-1[d]	75	100	50	50	200	250
Group F-2,S-2[d]	75	100	50	50	300	400
Group H-1	25	25	0	0	75	75
Group H-2	50	100	0	0	75	100
Group H-3	50	100	20	20	100	150
Group H-4	75	75	20	20	150	175
Group H-5	75	75	20	20	150	200
Group I-1	75	75	20	20	200	250
Group I-2 (Health Care)	NR	NR	NR	NR	150	200[c]
Group I-3 (Detention and Correctional – Use Conditions II, III, IV, V)	100	100	NR	NR	150[c]	200[c]
Group I-4 (Day Care Centers)	NR	NR	20	20	200	250
Group M (Covered Mall)	75	100	50	50	200	400
Group M (Mercantile)	75	100	50	50	200	250
Group R-1 (Hotels)	75	75	50	50	200	250
Group R-2 (Apartments)	75	75	50	50	200	250
Group R-3 (One- and Two-Family)	NR	NR	NR	NR	NR	NR
Group R-4 (Residential Care/Assisted Living	NR	NR	NR	NR	NR	NR
Group U	75	75	20	20	200	250

For SI: 1 foot = 304.8 mm.

a. 20 feet for common path serving 50 or more persons; 75 feet for common path serving less than 50 persons.
b. See Section 1025.9.5 for dead-end aisles in Group A occupancies.
c. This dimension is for the total travel distance, assuming incremental portions have fully utilized their allowable maximums. For travel distance within the room, and from the room exit access door to the exit, see the appropriate occupancy chapter.
d. See the *International Building Code* for special requirements on spacing of doors in aircraft hangars.

NR = No requirements.

4604.17.3 Exit access travel distance. Exits shall be located so that the maximum length of exit access travel, measured from the most remote point to an approved exit along the natural and unobstructed path of egress travel, does not exceed the distances given in Table 4604.17.2.

4604.17.4 Common path of egress travel. The common path of egress travel shall not exceed the distances given Table 4604.17.2.

4604.18 Stairway discharge identification. A stairway in an exit enclosure which continues below the level of exit discharge shall be arranged and marked to make the direction of egress to a public way readily identifiable.

Exception: Stairs that continue one-half story beyond the level of exit discharge need not be provided with barriers where the exit discharge is obvious.

4604.19 Exterior stairway protection. Exterior exit stairs shall be separated from the interior of the building as required in Section 1023.6. Openings shall be limited to those necessary for egress from normally occupied spaces.

Exceptions:

1. Separation from the interior of the building is not required for buildings that are two stories or less above grade where the level of exit discharge is the first story above grade.
2. Separation from the interior of the building is not required where the exterior stairway is served by an exterior balcony that connects two remote exterior stairways or other approved exits, with a perimeter that is not less than 50 percent open.To be considered open, the opening shall be a minimum of 50 percent of the height of the enclosing wall, with the top of the opening not less than 7 feet (2134 mm) above the top of the balcony.
3. Separation from the interior of the building is not required for an exterior stairway located in a building or structure that is permitted to have unenclosed interior stairways in accordance with Section 1020.1.
4. Separation from the interior of the building is not required for exterior stairways connected to open-ended corridors, provided that:
   4.1. The building, including corridors and stairs, is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
   4.2. The open-ended corridors comply with Section 1017.
   4.3. The open-ended corridors are connected on each end to an exterior exit stairway complying with Section 1023.1.
   4.4. At any location in an open-ended corridor where a change of direction exceeding 45 degrees occurs, a clear opening of not less than 35 square feet (3 m^2) or an exterior stairway shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

4604.20 Minimum aisles width. The minimum clear width of aisles shall be:

1. Forty-two inches (1067 mm) for aisle stairs having seating on each side.

   Exception: Thirty-six inches (914 mm) where the aisle serves less than 50 seats.

2. Thirty-six inches (914 mm) for stepped aisles having seating on only one side.

   Exception: Thirty inches (760 mm) for catchment areas serving not more than 60 seats.

3. Twenty inches (508 mm) between a stepped aisle handrail or guard and seating when the aisle is subdivided by the handrail.
4. Forty-two inches (1067 mm) for level or ramped aisles having seating on both sides.

   Exception: Thirty-six inches (914 mm) where the aisle serves less than 50 seats.

5. Thirty-six inches (914 mm) for level or ramped aisles having seating on only one side.

   Exception: Thirty inches (760 mm) for catchment areas serving not more than 60 seats.

6. Twenty-three inches (584 mm) between a stepped stair handrail and seating where an aisle does not serve more than five rows on one side.

4604.21 Stairway floor number signs. Existing stairs shall be marked in accordance with Section 1020.1.6.

TABLE 4603.1
OCCUPANCY AND USE REQUIREMENTS

Section	Use			Occupancy Classification																		
	High Rise	Atrium and Covered Mall	Under ground Building	A	B	E	F	H-1	H-2	H-3	H-4	H-5	I-1	I-2	I-3	I-4	M	R-1	R-2	R-3	R-4	S
4603.2	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4603.3.1	X		X										X	X	X	X						
4603.3.2	X		X	X	X	X	X	X	X	X	X	X					X	X	X		X	X
4603.3.3	X		X	X	X	X	X	X	X	X	X	X					X	X	X		X	X
4603.3.4		X																				
4603.3.5					X												X					
4603.3.6				X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
4603.3.7				X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
4603.4				X			X		X	X							X					
4603.5	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
4603.6.1						X																
4603.6.2													X									
4603.6.3														X								
4603.6.4															X							
4603.6.5																		X				
4603.6.6																			X			
4603.6.7																					X	
4603.7																		X	X	X	X	
4604	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

SECTION 4605
REQUIREMENTS FOR OUTDOOR OPERATIONS

4605.1 Tire storage yards. Existing tire storage yards shall be provided with fire apparatus access roads in accordance with Sections 4605.1.1 and 4605.1.2.

4605.1.1 Access to piles. Access roadways shall be within 150 feet (45 720 mm) of any point in the storage yard where storage piles are located, at least 20 feet (6096 mm) from any storage pile.

4605.1.2 Location within piles. Fire apparatus access roads shall be located within all pile clearances identified in Sections 2505.4 and within all fire breaks required in Section 2505.5.

2. Revise as follows:

102.1 Construction and design provisions. The construction and design provisions of this code shall apply to:

1. Structures, facilities and conditions arising after the adoption of this code.
2. Existing structures, facilities and conditions not legally in existence at the time of adoption of this code.
3. Existing structures, facilities and conditions when ~~identified in specific sections of this code~~ required in Chapter 46.
4. Existing structures, facilities and conditions which, in the opinion of the fire code official, constitute a distinct hazard to life or property.

SECTION 202
GENERAL DEFINITIONS

EXISTING. ~~Buildings, facilities or conditions which are already in existence, constructed or officially authorized prior to the adoption of this code.~~ See Section 4602.1.

607.1 Required. Existing elevators with a travel distance of 25 feet (7620 mm) or more ~~above or below the main floor or other level of a building and intended to serve the needs of emergency personnel for fire-fighting or rescue purposes shall be provided with emergency operation in accordance with ASME A17.3~~ shall comply with the requirements in Chapter 46. New elevators shall be provided with Phase I emergency recall operation and Phase II emergency in-car operation in accordance with ASME A17.1.

701.1 Scope. The provisions of this chapter shall specify the requirements for and the maintenance of fire-resistance-rated construction ~~and requirements for enclosing floor openings and shafts in existing buildings. New construction shall comply with the *International Building Code*~~.

704.1 Enclosure. Interior vertical shafts, including but not limited to stairways, elevator hoistways, service and utility shafts, that connect two or more stories of a building shall be enclosed or protected as ~~specified in Table 704.1~~ required in Chapter 46.

3. Delete Table 704.1 in its entirety without substitution as follows:

~~**TABLE 704.1**~~
~~**VERTICAL OPENING PROTECTION REQUIRED**~~

4. Revise as follows:

903.6.1 Pyroxylin plastics. All structures occupied for the manufacture or storage of articles of cellulose nitrate (pyroxylin) plastic shall be equipped with an approved automatic fire-extinguishing system when required in Chapter 46. ~~Vaults located within buildings for the storage of raw pyroxylin shall be protected with an approved automatic sprinkler system capable of discharging 1.66 gallons per minute per square foot (68 L/min/m^2) over the area of the vault.~~

905.11 Existing buildings. Existing structures ~~with occupied floors located more than 50 feet (15 240 mm) above or below the lowest level of fire department access~~ shall be equipped with standpipes installed in accordance with Section 905 when required in Chapter 46. ~~The standpipes shall have an approved fire department connection with hose connections at each floor level above or below the lowest level of fire department access. The fire code official is authorized to approve the installation of manual standpipe systems to achieve compliance with this section where the responding fire department is capable of providing the required hose flow at the highest standpipe outlet.~~

907.3 (Supp) Where required ~~– retroactive~~ in existing buildings and structures. An approved manual, automatic or manual and automatic fire alarm system shall be installed in existing buildings and structures ~~in accordance with Sections 907.3.1 through 907.3.1.8 and provide occupant notification in accordance with Section 907.6 unless other requirements are provided by other sections of this code~~ where required in Chapter 46.

> ~~**Exception:** Occupancies with an existing, previously approved fire alarm system.~~

~~**907.3.1 (Supp) Group E.** A fire alarm system shall be installed in existing Group E occupancies in accordance with Section 907.2.3.~~

> ~~**Exceptions:**~~
>
> ~~1. A manual fire alarm system is not required in a building with a maximum area of 1,000 square feet (93 m^2) that contains a single classroom and is located no closer than 50 feet (15 240 mm) from another building.~~
> ~~2. A manual fire alarm system is not required in Group E with an occupant load less than 50.~~

~~**907.3.2 (Supp) Group I.** A fire alarm system shall be installed in existing Group I occupancies in accordance with Sections 907.3.2.1 through 907.3.2.3.~~

Exception: Manual fire alarm boxes in resident or patient sleeping areas of Group I-1 and I-2 occupancies shall not be required at exits if located at all nurses= control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.5.2 are not exceeded.

907.3.2.1(Supp) Group I-1. An automatic or manual fire alarm system shall be installed in existing Group I-1 residential care/assisted living facilities in accordance with Section 907.2.6.1.

Exception: Where each sleeping room has a means of egress door opening directly to an exterior egress balcony that leads directly to the exits in accordance with Section 1014.5, and the building is not more than three stories in height.

907.3.2.2 (Supp) Group I-2. An automatic or manual fire alarm system shall be installed in existing Group I-2 occupancies in accordance with Section 907.2.6.2.

907.3.2.3 (Supp) Group I-3. An automatic or manual fire alarm system shall be installed in existing Group I-3 occupancies in accordance with Section 907.2.6.3.

907.3.3 (Supp) Group R. A fire alarm system and smoke alarms shall be installed in existing Group R occupancies in accordance with Sections 907.3.3.1 through 907.3.3.4.

907.3.3.1 (Supp) Group R-1 hotels and motels. An automatic or manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-1 hotels and motels more than three stories or with more than 20 sleeping units.

Exception: Buildings less than two stories in height where all sleeping units, attics and crawl spaces are separated by 1 hour fire resistance rated construction and each sleeping unit has direct access to a public way, exit court or yard.

907.3.3.2 (Supp) Group R-1 boarding and rooming houses. An automatic or manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-1 boarding and rooming houses.

Exception: Buildings that have single-station smoke alarms meeting or exceeding the requirements of Section 907.2.10.1 and where the fire alarm system includes at least one manual fire alarm box per floor arranged to initiate the alarm.

907.3.3.3 (Supp) Group R-2. An automatic or manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-2 occupancies more than three stories in height or with more than 16 dwelling units or sleeping units.

Exceptions:

1. Where each living unit is separated from other contiguous living units by fire barriers having a fire resistance rating of not less than 0.75 hour, and where each living unit has either its own independent exit or its own independent stairway or ramp discharging at grade.
2. A separate fire alarm system is not required in buildings that are equipped throughout with an approved supervised automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and having a local alarm to notify all occupants.
3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with Section 1023.6, Exception 4.

907.3.3.4 (Supp) Group R-4. An automatic or manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-4 residential care/assisted living facilities.

Exceptions:

1. Where there are interconnected smoke alarms meeting the requirements of Section 907.2.10 and there is at least one manual fire alarm box per floor arranged to sound continuously the smoke alarms.

2. Other manually activated, continuously sounding alarms approved by the fire code official.

907.3.4 (Supp) Single- and multiple-station smoke alarms. Single- and multiple-station smoke alarms shall be installed in existing Group R occupancies in accordance with Sections 907.3.4.1 through 907.3.4.3.

907.3.4.1 (Supp) Where required. Existing Group R occupancies not already provided with single-station smoke alarms shall be provided with single-station smoke alarms. Installation shall be in accordance with Section 907.2.10, except as provided in Sections 907.3.4.2 and 907.3.4.3.

907.3.4.2 (Supp) Interconnection. Where more than one smoke alarm is required to be installed within an individual dwelling unit or sleeping unit in Group R-1, R-2, R-3 or R-4, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

Exceptions:

1. Interconnection is not required in buildings that are not undergoing alterations, repairs or construction of any kind.
2. Smoke alarms in existing areas are not required to be interconnected where alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for interconnection without the removal of interior finishes.

907.3.4.3 (Supp) Power source. In Group R occupancies, single-station smoke alarms shall receive their primary power from the building wiring provided that such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery back-up shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exception: Smoke alarms are permitted to be solely battery operated: in existing buildings where no construction is taking place; in buildings that are not served from a commercial power source; and in existing areas of buildings undergoing alterations or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for building wiring without the removal of interior finishes.

5. Delete entire section without substitution:

SECTION 1027
MEANS OF EGRESS FOR EXISTING BUILDINGS

6. Revise as follows:

2506.1 Required access. New and existing tire storage yards shall be provided with fire apparatus access roads in accordance with Section 503 and this section. Existing tire storage yards shall be provided with fire apparatus access roads where required in Chapter 46.

Reason: This proposal relocates current requirements in the IFC to a new Chapter 46. The requirements being relocated all apply to construction requirements that specifically apply to existing buildings to one chapter. This relocation will facilitate in application and enforcement. The intent is to clarify the requirements and provide a single location for retroactive provisions and provide a quick reference table (Table 4603.1) to determine if there may be any requirements that would be applicable as the inspector is conducting the inspection.

Each of the provisions within the current code that refer to retroactive requirements will now have a reference to Chapter 46. Chapter 46 will contain all of the construction requirements which are retroactive and applicable to existing facilities or operations.

Currently, there is confusion as to when a construction requirement can be applied to an existing building. It has been said that in every case you must declare a "distinct hazard", however this is not correct. There are specific requirements that are already determined to be retroactive construction requirements because the voting membership has made the determination that they create a distinct hazard and placed the specific provisions in the code. Since the determination of a hazard is already accomplished it is not necessary for the code official to repeat the process. Therefore, all of the requirements in Chapter 46 will apply to existing buildings.

Section 102.1 #3 is revised to indicate that the retroactive construction provisions referred to by this section are located in Chapter 46. Thus clarifying which provisions in the are actually construction provisions that should be applied to an existing building. Only those provisions listed in Chapter 46 would apply to an existing facility. Therefore, all of the other construction items in the code apply to new construction. However, as is provided now in the IFC, the code official can still exercise judgement and declare a distinct hazard under Item #4 of Section 102.1 for other items or operations not addressed in Chapter 46.

All of the requirements relocated into Chapter 46 remain the same; the requirements have not been changed, except for Section 4604.1 for means of egress. The scope section has been clarified to indicate that existing buildings must still comply with the code under which the building was built and also the minimum egress requirements in Section 4604, whichever is more restrictive. In this fashion, a building will not be allowed to reduce the egress system protection or design from the original approval. Section 4604 is not as restrictive as new construction and allows for the continued use of existing buildings when the egress is at an acceptable standard, but yet not in complete compliance with the IBC.

A roadmap of the relocated sections is provided to assist in following the proposal:

Current Section	Proposed Section	Comment
102.1	102.1	Only revised for clarification to include reference to Chapter 46
202	4602.1	Relocated definition of EXISTING to Chapter 46
607.1	4603.2	No change in requirements
701.1	701.1	Only revision for clarification
704.1	4603.3 – 4603.3.7	Table is not used, but all of the requirements are contained in text in the subsections.
903.6.1	4603.4	No change in requirements
905.11	4603.5	No change in requirements
907.3 – 907.3.3.4	4603.6 – 4603.6.7	No change in requirements
907.3.4	4603.7.3	No change in requirements
1027	4604	All of the current requirements are relocated with a revision to Section 4604.1 for clarification on application.
2506.1	4605	No change in requirements

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

Committee Action: Approved as Modified

Modify the proposal as follows:

4601.2 Intent. The intent of this chapter is to provide a ~~reasonable~~ minimum degree of fire and life safety to persons occupying existing buildings by providing for alterations to such existing buildings which do not comply with the minimum requirements of the *International Building Code.*

4601.3 Permits. Permits shall be required as set forth in Section 105.7 and the *International Building Code* and this code.

4601.4.1 ~~Plans and specifications~~ Construction documents. ~~Plans and specifications~~ Construction documents for the necessary alterations shall be completed within a time schedule approved by the fire code official.

4603.1 Required modifications. ~~Means of egress in existing buildings shall comply with the requirements of Section 1027 and the building code that applied at the time of construction. Where these provisions conflict, the most restrictive provision shall apply.~~

~~For existing buildings that were not required to comply with a building code at the time of construction, such buildings shall comply with the requirements of Section 1027 and, in addition, shall have a life safety evaluation prepared, consistent with the requirements of Section 104.7.2. The life safety evaluation shall identify any changes to the means of egress that are necessary to provide safe egress to occupants and shall be subject to review and approval by the fire code official. The building shall be modified to comply with the recommendations set forth in the approved evaluation.~~ Existing buildings shall comply with not less than the minimum provisions specified in Table 4603.1 and as further enumerated in Sections 4603.2 through 4603.7.3.

The provisions of Chapter 46 shall not be construed to allow the elimination of fire-protection systems or a reduction in the level of fire safety provided in buildings constructed in conformance with previously adopted codes.

Exception: Group U Occupancies do not need to comply.

4603.3.6 Escalators connecting ~~less than~~ four or less stories. In other than Group B and M occupancies, escalators creating vertical openings connecting ~~less than~~ four stories or less shall be protected by either 1- hour fire-resistance-rated construction or an automatic sprinkler system in accordance with Sections 903.3.1.1 or 903.3.1.2 shall be installed throughout the building, and a draft curtain with closely spaced sprinklers shall be installed around the escalator opening.

4604.5 Illumination emergency power. The power supply for means of egress illumination shall normally be provided by the premises' electrical supply. In the event of power supply failure, illumination shall be automatically provided from an emergency system for the following occupancies where such occupancies require two or more means of egress:

1. Group A having 50 or more occupants.

   Exception: Assembly occupancies used exclusively as a place of worship and having an occupant load of less than 300.

2. Group B buildings three or more stories in height, buildings with 100 or more occupants above or below the level of exit discharge, or buildings with 1,000 or more total occupants.
3. Group E in interior stairs, corridors, windowless areas with student occupancy, shops and laboratories.
4. Group F having more than 100 occupants.

   Exception: Buildings used only during daylight hours which are provided with windows for natural light in accordance with the *International Building Code*.

5. Group I.
6. Group M.

   Exception: Buildings less than 3,000 square feet (279 m^2) in gross sales area on one story only, excluding mezzanines.

7. Group R-1.

Exception: Where each sleeping unit has direct access to the outside of the building at grade.

8. Group R-2.

   Exception: Where each dwelling unit or sleeping unit has direct access to the outside of the building at grade.

9. Group R-4.

   Exception: Where each sleeping unit has direct access to the outside of the building at ground level. ~~The emergency power system shall provide power for not less than 60 minutes and consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 604.~~

(Portions of proposal not shown remain unchanged)

Committee Reason: The committee agreed that the proponent's reason statement substantiates the need for the change which represents a significant effort to consolidate all retroactive construction requirements into a single chapter for a more user-friendly enforcement tool. The committee acknowledged that additional work may be needed on the new chapter but felt that the scope of the work done on this proposal warrants its inclusion in the code at this time. The modifications reflect the fact that the IFC is a minimum code (Section 4601.2), "Construction documents" rather than "plans and specifications" is the term used in the IFC (Section 4601.4.1) and the proposal is presented as containing no new changes, only a reorganization, and the struck-out text in Section 4604.5, Item 9 could not be accounted for as being existing. The modification to Section 4603.1 corrects an editorial error in the preparation of the original code change which inadvertently duplicated Section 4604.1. The modification to Section 4603.3.6 corrects the inadvertent omission of 4 story buildings in the preparation of the proposal.

Assembly Action: **None**

Analysis: The purpose of this proposal is to draw together in one chapter all of the current retroactive existing building construction requirements and affects not only the sections shown in this proposal but also any additional existing building construction requirements that may be approved in the current code development cycle. Those proposals, if approved, will be correlated with and placed into the new chapter.

Individual Consideration Agenda

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

Public Comment:

Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee, requests Approval as Modified by this public comment.

Further modify proposal as follows:

4601.2 Intent. The intent of this chapter is to provide a minimum degree of fire and life safety to persons occupying existing buildings by providing minimum construction requirements when ~~for alterations to~~ such existing buildings ~~which~~ do not comply with the minimum requirements of the *International Building Code.*

4601.3 Permits. Permits shall be required as set forth in Sections 105.6 and 105.7 and the *International Building Code* ~~and this code~~.

4601.4 Owner Notification. When a building is found to be in non-compliance with this chapter, the fire code official shall duly notify the owner of the building. Upon receipt of such notice, the owner shall, subject to the following time limits, take necessary actions to comply with the provisions of this Chapter ~~46~~.

4601.4.1 Construction documents. Construction documents ~~for the~~ necessary ~~alterations~~ to comply with this chapter shall be completed within a time schedule approved by the fire code official.

4601.4.2 Completion of work. Work ~~on the required alterations to the building~~ necessary to comply with this chapter shall be completed within a time schedule approved by the fire code official.

4603.1 Required ~~modifications~~ construction. Existing buildings shall comply with not less than the minimum provisions specified in Table 4603.1 and as further enumerated in Sections 4603.2 through 4603.7.3.
The provisions of Chapter 46 shall not be construed to allow the elimination of fire-protection systems or a reduction in the level of fire safety provided in buildings constructed in conformance with previously adopted codes.

Exception: Group U Occupancies do not need to comply.

TABLE 4603.1
OCCUPANCY AND USE REQUIREMENTS

Section	Special Use[a,b]			Occupancy Classification[a]																		
	High Rise	Atrium ~~and~~ or Covered Mall	Under ground Building	A	B	E	F	H-1	H-2	H-3	H-4	H-5	I-1	I-2	I-3	I-4	M	R-1	R-2	R-3	R-4	S
4603.2	~~X~~ R		~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R
4603.3.1	~~X~~ R		~~X~~ R										~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R						
4603.3.2	~~X~~ R		~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R					~~X~~ R	~~X~~ R	~~X~~ R		~~X~~ R	~~X~~ R
4603.3.3	~~X~~ R		~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R					~~X~~ R	~~X~~ R	~~X~~ R		~~X~~ R	~~X~~ R
4603.3.4		~~X~~ R																				
4603.3.5					~~X~~ R												~~X~~ R					
4603.3.6				~~X~~ R		~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R		~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R
4603.3.7				~~X~~ R		~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R		~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R
4603.4				~~X~~ R			~~X~~ R		~~X~~ R	~~X~~ R							~~X~~ R					
4603.5	~~X~~ R		~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R		~~X~~ R	~~X~~ R
4603.6.1						~~X~~ R																
4603.6.2													~~X~~ R									
4603.6.3														~~X~~ R								
4603.6.4															~~X~~ R							
4603.6.5																		~~X~~ R				
4603.6.6																			~~X~~ R			
4603.6.7																					~~X~~ R	
4603.7																		~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	
4604	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R	~~X~~ R

R = means the building is required to comply

a. Regardless of occupancy classification, when an existing building contains a special use the sections identified as Required shall apply
b. Existing buildings shall comply with the sections identified as Required based on occupancy classification or special uses, or both, whichever is applicable.

4603.3 Vertical openings. Interior vertical shafts, including but not limited to stairways, elevator hoistways, service and utility shafts that connect two or more stories of a building shall be enclosed or protected as specified in Sections ~~4603.2.1~~ 4603.3.1 through ~~4603. 2.7~~ 4603.3.7.

4604.1 General. Means of egress in existing buildings shall comply with the minimum egress requirements when specified in Table 4603.1 as further enumerated in Sections 4604.2 through 4604.21, and the building code that applied at the time of construction. Where the provisions of this chapter conflict with the original building code, the most restrictive provision shall apply.

Existing buildings that were not required to comply with a building code at the time of construction shall comply with the minimum egress requirements when specified in Table 4603.1 as further enumerated in Sections 4604.2 through 4604.21~~, and, in addition, shall have a life safety evaluation prepared, consistent with the requirements of Section 104.7.2. The life safety evaluation shall identify any changes to the means of egress that are necessary to provide safe egress to occupants and shall be subject to review and approval by the fire code official. The building shall be modified to comply with the recommendations set forth in the approved evaluation~~.

4604.5 Illumination emergency power. The power supply for means of egress illumination shall normally be provided by the premises' electrical supply. In the event of power supply failure, illumination shall be automatically provided from an emergency system for the following occupancies where such occupancies require two or more means of egress:

1. Group A having 50 or more occupants.

   Exception: Assembly occupancies used exclusively as a place of worship and having an occupant load of less than 300.

2. Group B buildings three or more stories in height, buildings with 100 or more occupants above or below the level of exit discharge, or buildings with 1,000 or more total occupants.

3. Group E in interior stairs, corridors, windowless areas with student occupancy, shops and laboratories.
4. Group F having more than 100 occupants.

   Exception: Buildings used only during daylight hours which are provided with windows for natural light in accordance with the *International Building Code*.

5. Group I.
6. Group M.

   Exception: Buildings less than 3,000 square feet (279 m^2) in gross sales area on one story only, excluding mezzanines.

7. Group R-1.

   Exception: Where each sleeping unit has direct access to the outside of the building at grade.

8. Group R-2.

   Exception: Where each dwelling unit or sleeping unit has direct access to the outside of the building at grade.

9. Group R-4.

   Exception: Where each sleeping unit has direct access to the outside of the building at ground level.

The emergency power system shall provide power for not less than 60 minutes and consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 604.

TABLE 4604.17.2
COMMON PATH, DEAD-END AND TRAVEL DISTANCE LIMITS (by occupancy)

Occupancy	Common Path Limit		Dead-End Limit		Travel Distance Limit	
	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)
Group A	20/75[a]	20/75[a]	20[b]	20[b]	200	250
Group B	75	100	50	50	200	~~250~~ 300
Group E	75	75	20	20	200	250
Group F-1,S-1[d]	75	100	50	50	200	250
Group F-2,S-2[d]	75	100	50	50	300	400
Group H-1	25	25	0	0	75	75
Group H-2	50	100	0	0	75	100
Group H-3	50	100	20	20	100	150
Group H-4	75	75	20	20	150	175
Group H-5	75	75	20	20	150	200
Group I-1	75	75	20	20	200	250
Group I-2 (Health Care)	NR	NR	NR	NR	150	200[c]
Group I-3 (Detention and Correctional – Use Conditions II, III, IV, V)	100	100	NR	NR	150[c]	200[c]
Group I-4 (Day Care Centers)	NR	NR	20	20	200	250
Group M (Covered Mall)	75	100	50	50	200	400
Group M (Mercantile)	75	100	50	50	200	250
Group R-1 (Hotels)	75	75	50	50	200	250
Group R-2 (Apartments)	75	~~75~~ 125	50	50	200	250
Group R-3 (One- and Two-Family)	NR	NR	NR	NR	NR	NR
Group R-4 (Residential Care/Assisted Living	NR	NR	NR	NR	NR	NR
Group U	75	~~75~~ 100	20	20	200	250

For SI: 1 foot = 304.8 mm.
NR = No requirements.
a. 20 feet for common path serving 50 or more persons; 75 feet for common path serving less than 50 persons.
b. See Section 1025.9.5 for dead-end aisles in Group A occupancies.
c. This dimension is for the total travel distance, assuming incremental portions have fully utilized their allowable maximums. For travel distance within the room, and from the room exit access door to the exit, see the appropriate occupancy chapter.
d. See the International Building Code for special requirements on spacing of doors in aircraft hangars.

905.11 Existing buildings. When required in Chapter 46, ~~E~~existing structures shall be equipped with standpipes installed in accordance with Section 905 ~~when required in Chapter 46~~.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This item was Approved as Modified by the Code Development Committee. This item relocates requirements scattered throughout the IFC into a new Chapter 46. The requirements being relocated are all construction requirements that apply specifically to existing buildings. This relocation facilitates application and enforcement. The original proposal clarifies the requirements and provides a single location for all retroactive construction provisions that would be applicable as the inspector is conducting the inspection.

The original proposal clarifies the application the retroactive construction provisions referred to in Section 102.1 #3, and separates the retroactive provisions from the need to declare a "distinct hazard". This also clarifies which provisions in the IFC are actually construction

provisions that should be applied to an existing building, by referencing Chapter 46. Therefore, all of the other construction items in the code apply to new construction.

The revisions in this Public Comment are proposed to add further clarity to the intent of each of the sections, and are based on testimony and discussion at the Public Hearing. The modifications in this Public Comment do not alter the requirements currently found in the 2006 IFC and the 2007 Supplement.

1. Section 4601.2 is revised to remove the word "alterations". "Alteration" is used as a trigger point for the *International Existing Building Code* and is specifically defined. The desire is to remove the potential confusion with that definition.
2. Section 4601.3: The Committee added the phrase "and this code" during the Public Hearing because of a desire to include other permit requirements. There is no need to reference IFC Section 105.7 and then say the entire code. Therefore, a reference to Section 105.6 "Operational Permits" has been added, and the reference to the entire code is deleted. The reference to the specific sections provides the user with more guidance than just stating the entire code.
3. Section 4601.4 is revised to clarify that the requirement for owner notification in Section 4601.4 is specific to this chapter and not to the entire code. Violations of other code sections are already handled in Chapter 1. This provision is specific since it refers to developing a timeline for repair as stated in the Subsection 4601.4.2.
4. Sections 4601.4.1 and 4601.4.2 are revised to remove the term "alterations".
5. Table 4603.1 is revised by adding footnotes to provide direction on the application of the table. Additionally, the "X" indicators have been replaced with "R" (Required).
6. Section 4603.3 is an editorial correction to reference the correct sections.
7. The 1st paragraph of Section 4604.1 is revised to clarify that the intent of the paragraph is to resolve conflicts between the original building code and this chapter, not the entire IFC.
8. The 2nd paragraph of Section 4604.1 is revised by deleting the requirement for a life safety evaluation. The minimum requirements are already established in Chapter 46. If additional egress issues exist, Section 102.1 allows for the code official to address distinct hazards.
9. Section 4604.5 is revised by re-inserting the text that was removed at the Public Hearing. Contrary to the Code Development Committee's assertion that the text is not in the IFC, the text can be found in Section 1027.5. It appeared to the committee that the text did not occur in that section because there was an editorial error in the monograph, and the text appeared as part of the exception above. The Committee appropriately removed the text from the exception, but did not re-inserted in the correct location. This revision will maintain consistency with the current IFC requirements.
10. Table 4604.17.2 is revised to provide correlation with IBC requirements for new construction. If these revisions are not made, then the requirements for new buildings will be less restrictive than the requirements for existing buildings. Changes as follows:
    1. For Group B, "Travel Distance Limit", "Sprinklered", 250' is revised to 300' to be consistent with IBC Table 1016.1.
    2. For Group R-2, "Common Path Limit", "Sprinklered", 75' is revised to 125' to be consistent with IBC Section 1014.3 Exception #4.
    3. For Group U, "Common Path Limit", "Sprinklered", 75' is revised to 100' to be consistent with IBC Section 1014.3 Exception #2
11. Section 905.11 is editorially revised by relocated the reference to Chapter 46 for clarity.

Final Action: AS AM AMPC____ D