F121-09/10
907.4, 907.4.1 (New) [IBC [F] 907.3, [F] 907.3.1 (New)]

Proposed Change as Submitted

Proponent: Rick Sheets, Fire Committee Chair, Brinks Home Security, representing National Burglar and Fire Alarm Association

Revise as follows:

907.4 (IBC [F] 907.3) Fire safety functions. Automatic fire detectors utilized for the purpose of performing fire safety functions shall be connected to the building's fire alarm control unit where a fire alarm system is required by Section 907.2. Detectors shall, upon actuation, perform the intended function and activate the alarm notification appliances or activate a visible and audible supervisory signal at *a constantly attended location.*

907.4.1 (IBC [F] 907.3.1) Power source. In buildings not equipped with a fire alarm system, the automatic fire detector shall be powered by normal electrical service and, upon actuation, perform the intended function. The detectors shall be located in accordance with NFPA 72.

> **Exception:** Elevator recall and supervisory service detectors shall be connected to a dedicated function fire alarm control unit that shall be designated as "Elevator Recall Control & Supervisory Unit".

Reason: Including this exception means monitoring the integrity of the initiating device circuits cannot be omitted. In the past, smoke alarms and heat detectors were directly wired in the elevator equipment without providing the required monitoring for integrity of the circuit wiring, allowing elevators to be used during a fire. The requirement for the use of a fire alarm control unit for elevator recall is also a requirement of NFPA 72, (found in Section 6.16.3 in the 2007 edition), and should be added here for conformity as well as safety.

Cost Impact: The code change proposal will not increase the cost of construction since compliance with NFPA 72 is already required by this code and elevator codes.

ICCFILENAME: SHEETS-F12-907.4.1.DOC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved as the exception has limited applicability and the code format of the exception was inappropriate. More specifically, the exception as written is actually a requirement which would be cause for confusion.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Rick Sheets, SET National Burglar and Fire Alarm Association, Approval as Modified by this Public Comment.

Modify proposal as follows:

[F] **907.4 Fire safety functions.** Automatic fire detectors utilized for the purpose of performing fire safety functions shall be connected to the building's fire alarm control unit where a fire alarm system is required by Section 907.2. Detectors shall, upon actuation, perform the intended function and activate the alarm notification appliances or activate a visible and audible supervisory signal at *a constantly attended location.*

~~**907.4.1 (IBC [F] 907.3.1) Power source.**~~ In buildings not equipped with a fire alarm system, the automatic fire detectors shall be ~~powered by normal electrical service and, upon actuation, perform the intended function~~. ~~The detectors shall be~~ located and installed in accordance with NFPA 72.

> ~~**Exception:** Elevator recall and supervisory service detectors shall be connected to a dedicated function fire alarm control unit that shall be designated as "Elevator Recall Control & Supervisory Unit".~~

Commenter's Reason: To ensure monitoring of integrity of wiring the fire safety function system should be required to be installed per NFPA 72, 2007 Section 6.16.3.

Final Action: AS AM AMPC____ D

F122-09/10
907.5.1 (IBC [F] 907.4.1)

Proposed Change as Submitted

Proponent: Thomas P. Hammerberg, Automatic Fire Alarm Association, Inc

Revise as follows:

907.5.1 (IBC [F] 907.4.1) Protection of fire alarm control unit. In areas that are not continuously occupied, a single smoke detector shall be provided at the location of each fire alarm control unit, notification appliance circuit power extenders and supervising station transmitting equipment.

Exceptions:

1. Where ambient conditions prohibit installation of smoke detector, a *heat detector* shall be permitted.
2. The smoke detector shall not be required where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

Reason: This exception was added to this requirement during the last code cycle so the language would be consistent with NFPA 72. This exception was deleted in the 2010 edition of NFPA 72, so needs to be deleted here for consistency.

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

ICCFILENAME: HAMMERBERG-F2-907.5.1.DOC

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee approved the proposal to delete the exception because it was felt that if the exception remains, early notification and alarm would be jeopardized since sprinklers react slower than smoke detectors.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

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

Commenter's Reason: We are in opposition of deleting Exception 2 which permits and recognizes that a building protected throughout by an automatic sprinkler systems, installed in accordance with the requirements in NFPA 13 provides an acceptable alterative to installing a smoke detector at the location of each fire alarm control unit, each notification appliance circuit power extender, and supervising station transmitting equipment within a building. It should be noted that this issue has been debated by the NFPA 72 Technical Committee over numerous code development cycles in NFPA 72 and involves much more than eliminating or installing 1 smoke detector directly over one fire alarm control unit.

We are in opposition for the following reasons:

1. The basis of Exception 2 was that the installation of a smoke detector over the subject equipment only offered limited value in terms of detecting all threats to a fire alarm system from a fire and that fire growth would be limited in a fully sprinklered building. It should be noted that the installation of a smoke detector within the vicinity of this equipment is not required to meet the spacing requirements for smoke detection in NFPA 72.
2. We strongly believe that the protection of each control unit, each notification appliance circuit power extender and supervising station transmitting equipment is a determination that should be made by the designer based on risk.
3. The proponent of this code change has not demonstrated that the installation of a smoke detector at the location of each fire alarm control unit, notification appliance circuit power extender, and supervising station transmitting equipment within a building protected throughout by an

automatic sprinkler system will improve the overall reliability and performance of the system based on the smoke detectors not meeting the spacing requirements in NFPA 72.

4. The proponents assumption that a smoke detector not meeting the spacing requirements in NFPA 72; installed at the location of each fire alarm control unit, notification appliance circuit power extender, and supervising station transmitting equipment in all conditions will protect the operation of the fire alarm system in a fire scenario is illogical and to delete the subject sprinkler exception is unreasonable since no evidence has been brought forth by the proponents that fire alarm system failures are occurring at an alarming rate due to a fires in buildings protected by an automatic sprinkler system without the subject smoke detector installed. In addition, no recent evidence has been brought forth by the proponents that the installation of the smoke detector of the fire alarm system protected the operation of the system in a fire scenario.
5. Proponents also stated in their testimony that an activated sprinkler could spray water on fire alarm control equipment, thus disabling the equipment. This should be a concern regardless of whether or not a smoke detector is installed above the control equipment. Sprinklers can also be activated by physical damage, and locating fire alarm control equipment in the direct spray pattern should probably be avoided in all conditions.
6. Proponents also noted that NFPA 13, Section 8.15.10.3 permits sprinklers to be omitted from certain electrical rooms, and thus there would be no sprinkler protection should a fire alarm control panel be installed in such a room. The "certain electrical rooms" permitted to have sprinklers omitted must comply with 4 conditions per NFPA 13: (1) the room is dedicated to electrical equipment only, (2) only dry-type electrical equipment is used, (3) equipment is installed in a 2 hour fire rated enclosure including protection for penetrations, and (4) no combustible storage is permitted in the room. When this is taken in context, it indicates that the room has limited combustible loading, and is protected from fire outside the room by a two hour enclosure. Rather than have this scenario be a source of concern regarding the protection of fire alarm control equipment, this sounds like an ideal application with 2 hour protection from fire outside the room, and no storage of combustibles permitted in the room. This scenario certainly isn't justification to remove exception no. 2. In addition, in all new high-rise construction, the building is required to be protected throughout by an automatic sprinkler system and the fire alarm control units are required to be installed in a fire command center that is separated from the remainder of the building by not less than a 1-hour fire barrier. Once again, this scenario certainly isn't justification to remove exception No. 2 and require the installation of unjustified smoke detection.

We also disagree with the proponent that this code change will not increase the cost of construction as the proponent has stated in his reason statement. We believe not only will this code change increase the cost of initial construction but will also increase the cost of maintenance over the life of the building.

Final Action: AS AM AMPC____ D

F128-09/10
907.6.2.3.4 (IBC [F] 907.5.2.3.4)

Proposed Change as Submitted

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

907.6.2.3.4 (IBC [F] 907.5.2.3.4) Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, all dwelling units and sleeping units shall be provided with the ~~capability~~ capacity at the fire alarm control unit to support visible alarm notification appliances in accordance with ICC A117.1.

Reason: The section indicates that all dwelling units shall be provided with the capability to support visible alarm notification appliances in accordance with ICC/ANSI A117.1. The code requires that all dwelling units be provided with the capability to support visible notification appliances, which allows for misinterpretation. The added text clarifies the intent for the dwelling units being capable of supporting visible notification appliances and provides a means of enforcing the intent of the code.

The cost of construction may or may not be increased depending on what is currently being used as the "norm" for meeting this provision. Therefore, the comment below is stating the position with regards to increase in cost. It is just as likely, however, that the cost will be reduced if there are more restrictive interpretations being used to meet the requirement.

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

ICCFILENAME: BOECKER-F5-907.6.2.3.4.DOC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Although the committee agreed that clarification of this section was necessary the proposal was disapproved with the primary concerns being that the revisions may conflict with ICC/ANSI A117.1 and would not clarify the intent of the section for visible alarm notification.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Lawrence G. Perry, AIA, representing Building Owners and Managers Association (BOMA) International, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

907.6.2.3.4 (IBC [F] 907.5.2.3.4) Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, all dwelling units and sleeping units shall be provided with the capability to support visible alarm notification appliances in accordance with ICC A117.1. Such capability shall be permitted to include the potential for future interconnection of the building fire alarm system with the unit smoke alarms, replacement of audible appliances with combination audible/visible appliances, or future extension of the existing wiring from the unit smoke alarm locations to required locations for visible appliances.

Commenter's Reason: This public comment seeks to better address the original intent of the 'capability' requirement for visible alarms in dwelling and sleeping units. As originally crafted by the A117 Committee, the intent was as follows:

1. It was assumed that the unit would be provided with hard-wired, interconnected smoke alarms.
2. It was assumed that the either the building fire alarm system would have an audible appliance within the unit (to satisfy audibility requirements); if not, at a minimum, the building fire alarm system would have wiring extended into the unit to a point where it could, in the future, be 'tapped' for use for visible signals within the unit.
3. It was assumed that, if visible appliances were needed within the unit in the future, that the fire alarm wiring could be interconnected with the smoke alarm wiring through a relay. The A117 Committee submitted a change to NFPA 72 to specifically permit this interconnection; this change was approved. It has since been expanded on to allow system interconnections, provided they meet protocols specified in NFPA 72.
4. It was assumed that providing visible alarm coverage in the unit would require replacement of audible-only appliances with combination audible/visible appliances, or additional wiring would be added from the audible appliance to the appropriate location of a newly-installed visible appliance.
5. There apparently are widely varying interpretations of the current IBC and A117 text. In some cases, all units are being required to be pre-wired for visible appliances, which was not the intent of the A117 Committee.

Final Action: AS AM AMPC____ D

F132-09/10, Part II
IRC R315, R202, Chapter 44

NOTE: PART I WAS WITHDRAWN BY PROPONENT. PART I IS REPRODUCED ONLY FOR INFORMATIONAL PURPOSES FOLLOWING ALL OF PART II.

Proposed Change as Submitted

Proponent: Roger Evans, Park City Municipal Corporation, representing Utah Chapter of ICC

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R315.1. Carbon monoxide alarms, carbon monoxide detectors or combination smoke/carbon monoxide devices. Carbon monoxide alarms, carbon monoxide detectors and combination smoke/carbon monoxide devices described in sections R315.1.1 through R315.1.4 shall be installed and maintained in accordance with the provisions of this code, NFPA 72 and NFPA 720. ~~**Carbon monoxide alarms.** In new construction, dwelling units within which fuel-fired appliances are installed or have attached garages shall be provided with an approved carbon monoxide alarm installed outside of each separate sleeping area in the immediate vicinity of the bedroom(s).~~

R315.1.1 Carbon monoxide alarms. Single- or multiple-station carbon monoxide alarms shall be listed and labeled in accordance with ANSI/UL 2034.

R315.1.2 Carbon monoxide detectors. Carbon monoxide detectors shall be listed and labeled in accordance with ANSI/UL 2075.

R315.1.3 Combination smoke/carbon monoxide alarms. Combination smoke/carbon monoxide alarms shall be listed and labeled in accordance with ANSI/UL 217 and ANSI/UL 2034

R315.1.4 Combination smoke/carbon monoxide detectors. Combination smoke/carbon monoxide detectors shall be listed and labeled in accordance with ANSI/UL 268 and ANSI/UL 2075.

R315.2 Where Required in New Construction. **In new construction within which fuel burning appliances exist or which have attached garages, carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors shall be installed in the following locations:**

1. Outside each separate dwelling unit sleeping area in the immediate vicinity of the bedrooms.
2. On every level of a dwelling unit, including basements

~~**R315.2**~~ **R315.3 Where required in existing dwellings.** Where work requiring a permit occurs in existing dwellings that have attached garages or in existing dwellings within which fuel-fired appliances exist, carbon monoxide alarms/detectors shall be provided in accordance with Sections R315.1 and R315.2.

~~**R315.3 Alarm Requirements** Single station carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.~~

R315.4 Carbon monoxide alarm signal requirements. Where more than one listed carbon monoxide alarm, or combination smoke/carbon monoxide is required to be installed within a dwelling unit they shall be interconnected in such a manner that the activation of one carbon monoxide alarm shall activate all of the carbon monoxide alarms in the dwelling unit and the activation of a carbon monoxide detector or combination smoke/carbon monoxide detector shall activate the carbon monoxide audible notification devices throughout the individual dwelling unit. The required carbon monoxide alarm signal shall be clearly audible in all sleeping rooms, having a sound level of at least 15 db above average ambient sound level or 5 db above the maximum sound level, or a sound level at least 75 db at the pillow.

R315.5 Power source. Required single- or multiple-station carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors shall receive their power by one of the following means:

1. Listed carbon monoxide alarms shall be battery-powered, plug-in with battery backup, or receive their primary power from the building wiring when such wiring is served from a commercial source with secondary power backup and without a disconnecting switch other than those required for overcurrent protection.Listed carbon monoxide alarms that are battery-powered or plug-in with battery backup shall not be permitted in new construction.
2. Listed carbon monoxide detectors shall receive their power from the approved control panel. The approved control panel shall receive its primary power from the building wiring when such wiring is served from a commercial source and the primary power source shall not include a disconnecting switch other than those required for overcurrent protection. The control panel shall be equipped with rechargeable batteries for secondary power backup.
3. Listed low-power radio frequency (wireless) detectors shall be permitted to be battery powered when the battery is electrically supervised and shall be capable of sending an alarm signal to the approved control panel for a minimum of 7 days after sending the initial battery depletion signal.

2. Add new definition to Section R202 as follows:

CARBON MONOXIDE.

Single-Station Carbon Monoxide Alarm. A device intended for the purpose of detecting carbon monoxide gas and alerting occupants by a distinct and audible signal comprising of an assembly that incorporates a sensor, control components and an alarm notification appliance in a single unit operated from a power source either located in the unit or obtained at the point of installation.

Multiple-Station Carbon Monoxide Alarm. A carbon monoxide alarm capable of being interconnected to one or more additional carbon monoxide alarms so that the actuation of one causes the appropriate alarm signal to be annunciated in all interconnected alarms.

Carbon Monoxide Detector. A device intended to be connected to an approved carbon monoxide detection system for the purpose of detecting carbon monoxide gas and alerting occupants by a distinct and audible signal.
Carbon Monoxide Detection System. A system of devices that consists of a control panel and circuits arranged to monitor and annunciate the status of carbon monoxide detectors and to initiate the appropriate response to those signals.

Combination Smoke/Carbon Monoxide Device. A device that combines a carbon monoxide alarm or carbon monoxide detector with smoke sensing technology; provided that the combined device is listed by a nationally recognized testing laboratory (NRTL) to the applicable ANSI/ UL Standards for both smoke detection and carbon monoxide detection. Such combined alarm units or detection systems shall emit an audible alarm in a manner that clearly differentiates between the two hazards as specified in the appropriate NFPA and ANSI/UL Standard.

3. Add new standards to Chapter 44 as follows:

NFPA
720-2009 Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment 2009 Edition

UL
2075-2004 First Edition of the Standard for Gas and vapor Detectors and Sensors, with revisions through September 28, 2007

Reason (Part II): The purpose for this code change is to improve the life safety of citizens by reducing the incidence of carbon monoxide (CO) poisoning in dwellings and to revise the language in the 2009 edition of the IRC so it is consistent with nationally recognized industry consensus standards.

The CO provisions in the 2009 edition of the IRC did not include the reliable, proven and tested technologies of system-connected CO detectors even though they meet nationally recognized industry consensus standards

1. ANSI/UL 2075, *Gas and Vapor Detectors and Sensors*
2. ANSI/NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*

The performance and reliability of system-connected CO detectors have shown to be extremely high if they are listed and maintained to ANSI/UL 2075 and installed in accordance with NFPA 720. System-connected CO detectors designed to be part of a carbon monoxide detection system are required to be connected to an approved panel. The panel is required to be equipped with rechargeable batteries that keep the carbon monoxide detection system operating during a power outage and will communicate the power loss condition to the supervising station. When the primary power is restored, the control panel will fully recharge the standby batteries. An added feature of a carbon monoxide detection system is that the interconnecting wiring to system-connected CO detectors are supervised such that a wiring fault results in a trouble signal at the premises and the supervising station.

The installation provisions in the 2009 edition of the IRC seem inconsistent with NFPA 720 when two or more CO alarms are installed within a dwelling unit. Section 9.6.5 of NFPA 720 requires that when two or more carbon monoxide alarms are to be installed that they are interconnected.. The rationale for this requirement is if a CO device is activated in the basement the occupants on the second floor on the opposite end of the home is unable to hear the audible alarm if the devices are not interconnected.

The 2009 edition of the IRC requires CO alarms outside each separate dwelling unit sleeping area in the immediate vicinity of the bedrooms. However, NFPA 720 requires CO devices to be installed on every level of a dwelling unit, including basements as well as outside each separate dwelling unit sleeping area in the immediate vicinity of the bedrooms.

Cost Impact (Part II): It is estimated that the proposed code modification will have a minimal cost impact on the construction of one- and two- family dwellings and townhouses. The proposed new requirements will not require addition CO detection devices to be installed; however the proposed changes will require additional wiring. While there are many variables that affect the cost of construction, most new dwelling construction is anticipated no more than two stories in height and will require wiring between no more than three CO detection devices: one per floor and one in the basement.

Analysis (Part II): A review of the standard(s) proposed for inclusion in the code, NFPA 720-2009, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

UL 2075 is already referenced in the IFC but not currently in the IBC. If the code change is approved, UL 2075 would be added to Chapter 35 of the IBC as a referenced standard.

ICCFILENAME: EVANSR-F1-908.DOC

Public Hearing Results

PART II- IRC B/E

Note: The following analysis was not in the Code Change monograph but was published on the ICC website at http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf :

Analysis: Review of the proposed new standards NFPA 720-2009 and UL 2075-2004 indicated that, in the opinion of ICC staff, the standards did comply with ICC standards criteria. Standard UL 2075 is already referenced in the IFC but not currently in the IRC. If the code change is approved, UL 2075 would be added to Chapter 44 of the IRC as a referenced standard.

Committee Action: **Disapproved**

Committee Reason: Based upon the proponent's request for disapproval. The proponent will rework this and bring it back to the Final Action.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Roger R. Evans, Park City Municipal Corporation, representing Utah Chapter of ICC, requests Approval as Modified by this Public Comment.

Replace the proposal with the following:

Add new text as follows:

R315.2 Carbon monoxide detection systems. Carbon monoxide detection systems, that include carbon monoxide detectors and audible notification appliances, installed and maintained in accordance with this section for carbon monoxide alarms and NFPA 720 shall be permitted. The carbon monoxide detectors shall be listed as complying with UL 2075. Where a household carbon monoxide detection system is installed it shall become a permanent fixture of the occupancy, owned by the homeowner and shall be monitored by an approved supervising station.

Exception: Where carbon monoxide alarms are installed meeting the requirements of Section R315.1 compliance with Section 315.2 is not required.

Add standards to Chapter 44 as follows:

NFPA 720-2009 Standard for the Installation of Carbon Monoxide (C0) Detection and Warning Equipment 2009 Edition

UL 2075-2004 First Edition of the Standard for Gas and vapor Detectors and Sensors, with revisions through September 28, 2007.

Commenter's Reason: The purpose of the original proposal was to permit carbon monoxide detection systems that include carbon monoxide detectors and audible notification appliance to be installed. During the Code Development Hearings the proponent realized the original proposal needed to be reworked and asked the committee to disapprove so that a public comment could be submitted for the Final Action Hearing. Therefore this public comment provides a straightforward solution of permitting carbon monoxide detection systems and carbon monoxide detectors to be installed. Furthermore, the requirement for the household carbon monoxide detection system to be owned by the homeowner and to be monitored by an approved supervising station mirrors the household fire alarm system requirements that were added to Section 314.2 of the 2009 edition of the IRC.

Final Action: AS AM AMPC____ D

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

F132-09/10, Part I
908 (New) [IBC [F] 908(New)], 902 (IBC [F] 902), Chapter 47 (IBC Chapter 35)

PART I – IFC

1. Add new text as follows:

SECTION 908 (IBC SECTION [F] 908)
CARBON MONOXIDE ALARMS AND
CARBON MONOXIDE DETECTION SYSTEMS

908.1 General. This section covers the application, installation, performance and maintenance of carbon monoxide alarms and carbon monoxide detection systems in new buildings and structures.

908.1.1 Carbon monoxide alarms, carbon monoxide detectors and combination smoke/carbon monoxide devices. Carbon monoxide alarms, carbon monoxide detectors and combination smoke/carbon monoxide alarms and combination smoke/carbon monoxide detectors described in sections 908.1.2 through 908.1.5 shall be installed and maintained in accordance with the provisions of this code, NFPA 72 and NFPA 720.

908.1.2 Carbon monoxide alarms. Single- or multiple-station carbon monoxide alarms shall be listed and labeled in accordance with ANSI/UL 2034.

908.1.3 Carbon monoxide detectors. Carbon monoxide detectors shall be listed and labeled in accordance with ANSI/UL 2075.

908.1.4 Combination smoke/carbon monoxide alarms. Combination smoke/carbon monoxide alarms shall be listed and labeled in accordance with ANSI/UL 217 and ANSI/UL 2034

908.1.5 Combination smoke/carbon monoxide detectors. Combination smoke/carbon monoxide detectors shall be listed and labeled in accordance with ANSI/UL 268 and ANSI/UL 2075

908.2 Power Source. Required single- or multiple-station carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors shall receive their power by one of the following means:

1. Listed carbon monoxide alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source with secondary power backup and without a disconnecting switch other than those required for overcurrent protection. Listed carbon monoxide alarms that are battery-powered or plug-in with battery backup shall not be permitted in new construction.
2. Listed carbon monoxide detectors shall receive their power from the approved control panel. The approved control panel shall receive its primary power from the building wiring when such wiring is served from a commercial source and the primary power source shall not include a disconnecting switch other than those required for overcurrent protection. The control panel shall be equipped with rechargeable batteries for secondary power backup.
3. Listed low-power radio frequency (wireless) detectors shall be permitted to be battery powered when the battery is electrically supervised and shall be capable of sending an alarm signal to the approved control panel for a minimum of 7 days after sending the initial battery depletion signal.

908.2.1 Interconnection. Where more than one listed carbon monoxide alarm, or, combination smoke/carbon monoxide alarm is required to be installed within a dwelling unit they shall be interconnected in such a manner that the activation of one carbon monoxide alarm shall activate all of the carbon monoxide alarms in the dwelling unit and the activation of a carbon monoxide detector or combination smoke/carbon monoxide detector shall activate the carbon monoxide audible notification devices throughout the individual dwelling unit. The required carbon monoxide alarm signal shall be clearly audible in all sleeping rooms, having a sound level of at least 15 db above average ambient sound level or 5 db above the maximum sound level, or a sound level at least 75 db at the pillow.

Exception: Carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors installed in existing construction shall not be required to cause all carbon monoxide alarms to sound.

908.2.2 Acceptance testing. When the installation of carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors is complete, each alarm or detector and interconnecting wiring shall be tested in accordance with NFPA 72 and NFPA 720.

908.2.3 Where required. Listed single- or multiple-station carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors shall be installed in locations described in sections 908.2.4 through 908.2.5.

908.2.4 Group R-1. Group R-1 occupancies located in a buildings that contain fuel burning appliances or which have attached garages, listed multiple-station carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors shall be installed in the following locations:

1. On the ceiling or wall of the same room as permanently installed fuel burning appliances in accordance with manufacturers published instructions
2. Centrally located on every habitable level, in every HVAC zone of the building

Exception: Carbon monoxide alarms or carbon monoxide detectors shall not be required in sleeping units unless the sleeping unit contains a fuel-burning appliance.

The required carbon monoxide alarms or carbon monoxide detectors shall be annunciated at a constantly attended location

908.2.5 Groups R-2, R-3 and R-4. Group R-2, R-3 and R-4 occupancies located in buildings that contain fuel burning appliances or which have attached garages, listed multiple-station carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors shall be installed in the following:

1. Outside each separate dwelling unit sleeping area in the immediate vicinity of the bedrooms
2. On every level of a dwelling unit, including basements and in every HVAC zone of the building
3. On the ceiling or wall of the same room as permanently installed fuel burning appliances in accordance with manufacturers published instructions.

Exception: Carbon monoxide alarms or carbon monoxide detectors shall not be required in sleeping units unless the sleeping unit contains a fuel-burning appliance.

The required carbon monoxide alarms or carbon monoxide detectors shall be annunciated at a constantly attended location

2. Add new definitions as follows:

902.1(IBC [F] 902.1) 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.

CARBON MONOXIDE.

Single-Station Carbon Monoxide Alarm. A device intended for the purpose of detecting carbon monoxide gas and alerting occupants by a distinct and audible signal comprising of an assembly that incorporates a sensor, control components and an alarm notification appliance in a single unit operated from a power source either located in the unit or obtained at the point of installation.

Multiple-Station Carbon Monoxide Alarm. A carbon monoxide alarm capable of being interconnected to one or more additional carbon monoxide alarms so that the actuation of one causes the appropriate alarm signal to be annunciated in all interconnected alarms.

Carbon Monoxide Detector. A device intended to be connected to an approved carbon monoxide detection system for the purpose of detecting carbon monoxide gas and alerting occupants by a distinct and audible signal.

Carbon Monoxide Detection System. A system of devices that consists of a control panel and circuits arranged to monitor and annunciate the status of carbon monoxide detectors and to initiate the appropriate response to those signals.

Combination Smoke/Carbon Monoxide Device. A device that combines a carbon monoxide alarm or carbon monoxide detector with smoke sensing technology; provided that the combined device is listed by a nationally recognized testing laboratory (NRTL) to the applicable ANSI/ UL Standards for both smoke detection and carbon monoxide detection. Such combined alarm units or detection systems shall emit an audible alarm in a manner that clearly differentiates between the two hazards as specified in the appropriate NFPA and ANSI/UL Standard.

3. Add new standards to Chapter 47 (IBC Chapter 35) as follows:

NFPA	
720-2009	Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment 2009 Edition
UL	
2034-2008	Standard for Single and Multiple Station Carbon Monoxide Alarms, with Revisions through February 20, 2009
2075-2004	Standard for Gas and vapor Detectors and Sensors, with revisions through September 28, 2007

Reason (Part I): The purpose for this code change is to protect people sleeping in commercial Group R occupancies such as hotels, motels, adult & child day care, apartments and dormitories from serious injury or possibly death from unintentional non-fire related carbon monoxide (CO) exposure by mandating the installation of carbon monoxide detection devices. The Centers for Disease Control and Prevention (CDC) reports that an estimated 15,000 emergency department visits and 500 unintentional deaths in the United States each year for the six year period 1999-2004. These carbon monoxide incidents were a contributing factor for 20 states enacting laws to require the installation of carbon monoxide detection devices. Of the 20 states that have adopted requirements for carbon monoxide detection, ten require the installation of carbon monoxide detectors in commercial Group R occupancies. In the absence of a national installation standard for commercial Group R occupancies each jurisdiction developed its own regulations with varying installation requirements.

We recommend that the International Fire Code develop the necessary installation requirements for CO detection devices in commercial Group R.

Cost Impact (Part I): It is estimated that the proposed code modification will have a minimal cost impact on the construction of Group R occupancies. For example in R-1 occupancies a CO alarm or detector will be installed by fuel burning appliance(s) and in each HVAC zone. In other R occupancies cost will be minimal as installation requirements are outside of each sleeping area and on each floor.

Analysis (Part I): UL 2034 is already referenced in the IRC but not currently in the IFC or IBC. If the code change is approved, UL 2034 would be added to Chapter 47 of the IFC and Chapter 35 of the IBC as a referenced standard.

UL 2075 is already referenced in the IFC but not currently in the IBC. If the code change is approved, UL 2075 would be added to Chapter 35 of the IBC as a referenced standard.

PART I- IFC **Withdrawn by Proponent**

F133-09/10

908.7 (New) [IBC [F] 908.7 (New)], 4606.1 (New), Chapter 47 (IBC Chapter 35)

Proposed Change as Submitted

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

1. Add new text as follows:

908.7 (IBC [F] 908.7) Carbon monoxide alarms. Group I or R occupancies located in a building containing a fuel-burning appliance or a building which has an attached garage shall be provided with single station carbon monoxide alarms. The carbon monoxide alarms shall be listed as complying with UL 2034 and be installed and maintained in accordance with NFPA 720 and the manufacturer's instructions. An open parking garage, as defined in the *International Building Code*, shall not be deemed to be an attached garage.

Exception: Sleeping units or dwelling units which do not themselves contain a fuel-burning appliance or have an attached garage, but which are located in a building with a fuel-burning appliance or an attached garage, need not be provided with single station carbon monoxide alarms provided that:

1. The ~~s~~leeping unit or dwelling unit is located more than one story above or below any story which contains a fuel-burning appliance or an attached garage;

2. The sleeping unit or dwelling unit is not connected by duct work or ventilation shafts to any room containing a fuel-burning appliance or to an attached garage; and
3. The building is provided with a common area carbon monoxide alarm system.

4606.1 Carbon monoxide alarms. Existing Group I or R occupancies located in a building containing a fuel-burning appliance or a building which has an attached garage shall be provided with single station carbon monoxide alarms. The carbon monoxide alarms shall be listed as complying with UL 2034 and be installed and maintained in accordance with NFPA 720 and the manufacturer's instructions. An open parking garage, as defined in the *International Building Code*, shall not be deemed to be an attached garage.

Exception: Sleeping units or dwelling units which do not themselves contain a fuel-burning appliance or have an attached garage, but which are located in a building with a fuel-burning appliance or an attached garage, need not be provided with single station carbon monoxide alarms provided that:

1. The sleeping units or dwelling unit is located more than one story above or below any story which contains a fuel-burning appliance or an attached garage;
2. The sleeping units or dwelling unit is not connected by duct work or ventilation shafts to any room containing a fuel-burning appliance or to an attached garage; and
3. The building is provided with a common area carbon monoxide alarm system.

2. Add new standards to Chapter 47 (IBC Chapter 35) as follows:

NFPA
720-2005 Standard for the Installation of Carbon Monoxide (CO) Warning Equipment in Dwelling Units

UL
2034-2008 Standard for Single and Multiple Station Carbon Monoxide Alarms

Reason: At the final action hearings for the last code change cycle held in Minnesota the voting membership present voted overwhelmingly to add requirements for the installation of carbon monoxide alarms for dwelling units built in compliance with the International Residential Code (IRC). The threat of poisoning from exposure to carbon monoxide is not limited to dwellings regulated by the IRC, it includes other institutional and residential occupancies. This proposal is intended to provide correlation with the position the membership took on this issue and add language to the IBC/IFC requiring the installation of carbon monoxide alarms in institutional and residential group occupancies.

According to the Journal of the American Medical Association (JAMA), carbon monoxide is the leading cause of accidental poisoning deaths in America with approximately 2,100 deaths per year. http://jama.ama-assn.org/cgi/search?fulltext=Carbon+Monoxide Over 15,000 people seek medical attention due to carbon monoxide exposure each year. http://www.ul.com/newsroom/newsrel/nr012609a.html

The industry has addressed the issue of reliability by updating the requirements of the UL 2034 standard. http://www.iccsafe.org/cs/cc/ctc/CO/CO_UL2034History.pdf Underwriters Laboratories instituted a Carbon Monoxide Field Study in 1994 and completed the study in March of 2004. The report on the study includes the following summary:

"Throughout the first phase of this study, the CO alarms have performed in an effective manor. During the September 2002 tests we recorded our first false positive at 70ppm CO (94 minutes into the test, post 1998 alarm). Also during the September 2002 tests we recorded our first no response sample (pre1998 alarm). During the September 2003 we recorded a significant late response sample (pre1998 alarm). These samples have been returned and analyzed by the manufacturer and/or the UL Field Report Group has opened an investigation. Other samples in the survey of the same, or similar, models are continuing to perform as expected.

On one occasion, a field study CO sample alarmed in an employee's home after their furnace was serviced. It was confirmed that there was a high level of CO present in their home. The problem was corrected and the alarm continues to function properly during follow-up sensitivity tests. On another occasion, a field sample was activated when the damper on a fireplace closed prematurely. The damper was opened, the house vented, and the alarm returned to its normal standby condition.

Throughout the entire survey program we have experienced a few units providing early/delayed signals during the sensitivity tests, but all of these CO alarms would provide effective signaling protection to the users should there be a fatal concentration of CO.

Of the few CO alarms that did not meet the UL2034 test points, most of them alarmed early and it was determined with the Stability Test results that these samples would most likely not false alarm in the field.

It is important to note that providing effective signaling protection does not necessarily mean complying with the finite test points of UL2034. All the alarms would have sounded while a person can react and follow the recommended procedures during an alarm signal.

The data shows that these CO alarms are providing the necessary signaling protection."
http://www.iccsafe.org/cs/cc/ctc/CO/CO_UL_AlarmSurvey.doc

All carbon monoxide detectors available today meet the updated requirements of the UL standard which eliminated the false positive indications that occurred when carbon monoxide detectors were first brought to market in the 1990's. The State of New Jersey has had regulations mandating the installation of carbon monoxide alarms in all new and existing residential occupancies since 1992. The state implemented a reporting program at that time to identify reliability and false positive indication problems and there have been no problems identified in over 10 years.

Carbon monoxide poisonings leading to injury or death is well documented and the only way to protect the occupants from this odorless and tasteless product of combustion, known as the "Silent Killer" is through the installation of detectors complying with today's standards.

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

Analysis: A review of the standards proposed for inclusion in the code, NFPA 720-2005 and UL 2034-2008, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: DAVIDSON-SHUMAN-F14-908.7.DOC

Public Hearing Results

Committee Action: Approved as Modified

Note: The following analysis was not in the Code Change monograph but was published on the ICC website at http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf

Analysis: Review of proposed new standards NFPA 720-2009 and UL 2034-2008 indicated that, in the opinion of ICC Staff, the standards did comply with ICC standards criteria.

Modify proposal as follows:

908.7 (IBC [F] 908.7) Carbon monoxide alarms. Group I or R occupancies located in a building containing a fuel-burning appliance or a building which has an attached garage shall be provided with single station carbon monoxide alarms. The carbon monoxide alarms shall be listed as complying with UL 2034 and be installed and maintained in accordance with NFPA 720 and the manufacturer's instructions. An open parking garage, as defined in the *International Building Code*, or enclosed parking garage ventilated in accordance with Section 404 of the *International Mechanical Code* shall not be deemed to be an attached garage.

Exception: Sleeping units or dwelling units which do not themselves contain a fuel-burning appliance or have an attached garage, but which are located in a building with a fuel-burning appliance or an attached garage, need not be provided with single station carbon monoxide alarms provided that:

1. The sleeping unit or dwelling unit is located more than one story above or below any story which contains a fuel-burning appliance or an attached garage;
2. The sleeping unit or dwelling unit is not connected by duct work or ventilation shafts to any room containing a fuel-burning appliance or to an attached garage; and
3. The building is provided with a common area carbon monoxide alarm system.

908.7.1 Carbon monoxide detection systems. Carbon monoxide detection systems, that include carbon monoxide detectors and audible notification appliances, installed and maintained in accordance with this section for carbon monoxide alarms and NFPA 720 shall be permitted. The carbon monoxide detectors shall be listed as complying with UL 2075.

4606.1 Carbon monoxide alarms. Existing Group I or R occupancies located in a building containing a fuel-burning appliance or a building which has an attached garage shall be provided with single station carbon monoxide alarms. The carbon monoxide alarms shall be listed as complying with UL 2034 and be installed and maintained in accordance with NFPA 720 and the manufacturer's instructions. An open parking garage, as defined in the *International Building Code*, or enclosed parking garage ventilated in accordance with Section 404 of the *International Mechanical Code* shall not be deemed to be an attached garage.

Exception: Sleeping units or dwelling units which do not themselves contain a fuel-burning appliance or have an attached garage, but which are located in a building with a fuel-burning appliance or an attached garage, need not be provided with single station carbon monoxide alarms provided that:

1. The sleeping units or dwelling unit is located more than one story above or below any story which contains a fuel-burning appliance or an attached garage;
2. The sleeping units or dwelling unit is not connected by duct work or ventilation shafts to any room containing a fuel-burning appliance or to an attached garage; and
3. The building is provided with a common area carbon monoxide alarm system.

(Portions of the proposal not shown remain unchanged.)

Committee Reason: The committee approved the proposal adding CO detectors to the code since having provisions within the IBC and IFC is a better approach than what has been occurring on a state level through the legislative process. This also makes the IBC and IFC consistent with the IRC. The first modification clarifies that ventilated enclosed parking garages were not intended to be considered as an attached garage for the purposes of enforcing this section. The second modification includes the use of CO detectors and associated systems in accordance with UL 2075. Such detectors are allowed by NFPA 720 and the committee felt it was appropriate to recognize both CO alarms and detectors.

Assembly Action: None

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

Public Comment:

Ron Nickson representing National Multi Housing Council, requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

908.7 (IBC [F] 908.7) Carbon monoxide alarms. Group I or R occupancies located in a building containing a fuel-burning appliance or a building which has an attached garage with a communicating opening shall be provided with single station carbon monoxide alarms outside of each separate dwelling unit sleeping area in the immediate vicinity of the bedrooms and on every occupiable level of a dwelling unit. The carbon monoxide alarms

shall be listed as complying with UL 2034 and be installed and maintained in accordance with NFPA 720 and the manufacturer's instructions. An open parking garage, as defined in the *International Building Code*, or enclosed parking garage ventilated in accordance with Section 404 of the *International Mechanical Code* shall not be deemed to be an attached garage.

Exception: Sleeping units or dwelling units which do not themselves contain a fuel-burning appliance or have an attached garage, but which are located in a building with a fuel-burning appliance or an attached garage, need not be provided with single station carbon monoxide alarms provided that:

1. The sleeping unit or dwelling unit is located more than one story above or below any story which contains a fuel-burning appliance or an attached garage;
2. The sleeping unit or dwelling unit is not connected by duct work or ventilation shafts to any room containing a fuel-burning appliance or to an attached garage; and
3. ~~The building is provided with a common area carbon monoxide alarm system the room with the fuel burning~~ A carbon monoxide detector is installed in the room containing the fuel burning appliance.

908.7.1 Carbon monoxide detection systems. Carbon monoxide detection systems, that include carbon monoxide detectors and audible notification appliances, installed and maintained in accordance with this section for carbon monoxide alarms and NFPA 720 shall be permitted. The carbon monoxide detectors shall be listed as complying with UL 2075.

4606.1 Carbon monoxide alarms. Existing Group I or R occupancies located in a building containing a fuel burning appliance or a building which has an attached garage with a communicating opening shall be provided with single station carbon monoxide alarms outside of each separate dwelling unit sleeping area in the immediate vicinity of the bedrooms and on every occupiable level of a dwelling unit . The carbon monoxide alarms shall be listed as complying with UL 2034 and be installed and maintained in accordance with NFPA 720 and the manufacturer's instructions. An open parking garage, as defined in the *International Building Code*, or enclosed parking garage ventilated in accordance with Section 404 of the *International Mechanical Code* shall not be deemed to be an attached garage.

Exception: Sleeping units or dwelling units which do not themselves contain a fuel-burning appliance or have an attached garage, but which are located in a building with a fuel-burning appliance or an attached garage, need not be provided with single station carbon monoxide alarms provided that:

1. The sleeping units or dwelling unit is located more than one story above or below any story which contains a fuel-burning appliance or an attached garage;
2. The sleeping units or dwelling unit is not connected by duct work or ventilation shafts to any room containing a fuel-burning appliance or to an attached garage; and
3. ~~The building is provided with a common area carbon monoxide alarm system the room with the fuel burning~~ A carbon monoxide detector is installed in the room containing the fuel burning appliance.

(Portions of the proposal not shown remain unchanged.)

Commenter's Reason: The modification to F133 cleans up the language approved during the code development hearings as to when carbon monoxide detection is required in Group I and R occupancies. The change modifies the requirement to requirement carbon monoxide detectors only when the attached garage has an opening that communicates with the dwelling unit and second clarifies the location when the carbon monoxide detectors are installed. The change to item 3 of the exception removes the requirement for a carbon monoxide alarm system and requires only that a carbon monoxide detector be installed in the room containing a fuel burning appliance. This type of installation would provide warning of any problem with the heating system, without the excessive cost burden associated with a complete carbon monoxide alarm system.

This change as modified has been submitted as a public comment to PM-23-09/10 which was approved by the code development establishing requirements for carbon monoxide in the IPMC and IEBC. If the modifications as proposed above and the modifications as proposed by NMHC to PM23-09/10 are approved by the membership the codes will be aligned with the same requirements thus eliminating the problem that the requirements for new construction differ from those in the IPMC and IEBC that are enforced after the building is completed.

F134-09/10

909.2 (IBC [F] 909.2), 909.10.2.1 (IBC [F] 909.10.2.1)

Proposed Change as Submitted

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council

Revise as follows:

909.2 (IBC [F] 909.2) General design requirements. Buildings, structures or parts thereof required by this code to have a smoke control system or systems, or a stair pressurization system shall have such systems designed in accordance with the applicable requirements of Section 909 and the generally accepted and well-established principles of engineering relevant to the design. The construction documents shall include sufficient information and detail to adequately describe the elements of the design necessary for the proper implementation of the smoke control systems. These documents shall be accompanied by sufficient information and analysis to demonstrate compliance with these provisions.

909.20.6.1 Ventilation systems. Smokeproof enclosure and pressurized stairway ventilation systems shall be independent of other building ventilation systems. The equipment, control wiring, power wiring and ductwork shall comply with one of the following:

1. Equipment, control wiring, power wiring and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or pressurized stairway or connected to the smokeproof enclosure or pressurized stairway by ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both.
2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure or pressurized stairway with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both.
3. Equipment, control wiring, power wiring and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both.

Exceptions:

1. Control wiring and power wiring utilizing a 2-hour rated cable or cable system.
2. Where encased with not less than 2 inches (51 mm) of concrete.
3. Ductwork shall be permitted to be protected using an approved alternative fire-resistive duct assembly that is a *listed* and *labeled* specifically for such purpose.

Reason: This proposal would require Stair pressurization ducts installed for the purposes of stairwell pressurization to be enclosed within a shaft or protected by an equivalent tested and listed assembly or system evaluated for the purpose. Smoke control systems have been required in nearly two thirds of the United States for over a decade. High-rise buildings constructed to the requirements of International Building Code, but without any specific measures to control smoke migration, are all the more vulnerable to property damage and occupants' loss of life.

The purpose of a closed pressurization system is to provide fresh air directly to stairwells or egress areas. This design air pressures need to be sufficient to maintain closed doors while preventing smoke from entering the egress path. Several incidents in North America during the past 40 years have demonstrated that serious fires can occur in modern high-rise buildings, that these fires can generate tremendous quantities of smoke, and that smoke can spread rapidly throughout these buildings. Most notable were the 1970 One New York Plaza fire, the1973 Hyatt Regency O'Hare Hotel fire, the 1980 MGM Grand Hotel in Las Vegas, a 1981 fire in North York Ontario at the Inn on the Park Hotel, the 1983 First Canadian Place in Toronto, Ontario, One Meridian Plaza, Philadelphia, Pennsylvania and the First Interstate Bank in Los Angeles, California in the 1990's, and the 2001 World Trade Center.

There is a large body of available research that indicates the need for smoke control is more pressing in tall buildings that in any other type of construction. Pressurization results in airflows of high velocity in the gaps around closed doors and construction cracks, thereby preventing smoke from flowing back into the pressurized space through these openings. Pressurized stairwells are provided with the goal of maintaining a tenable environment within the escape routes in the event of a building fire. While the option to use stairwell pressurization exists, the IBC does not require stairwell pressurization in high-rise buildings, and only requires smoke control in underground buildings, atriums, and covered mall buildings. Section 403.13 of the 2009 IBC requires smokeproof exit enclosures for high-rise buildings in every required stairway serving floors more than 75 feet (22.86 m) above the ground. Section 909.20.5 merely permits sprinklered Buildings to use stairwell pressurization as an alternate to the smokeproof enclosures. When employed, ducts used for Stair pressurization to provide uncontaminated air within required interior exit stairwells or areas of egress need to be protected from the effect of fire, or constructed as fire resistant systems.

Particularly in the case of tall buildings, the predominant factors that cause smoke movement in tall buildings are stack effects, the affect of external wind forces, and forced air movement within the building. Smoke removal and venting practices are complicated by stack effects, which will tend to favor natural air movement vertically through the building as a result of differences in temperature and densities between the inside and outside air. [1]

Options such as the use of natural ventilation are only available where openings in exterior stairwells can be accommodated. Even then, a number of problems have been identified with this approach. Firstly, the required volume of fresh air is high. Secondly, natural supply and exhaust through vents may be subject to adverse exterior wind conditions, and even when functioning satisfactorily, would generally require vents located on different exterior walls. Thirdly, the performance of natural vents is influenced by building stack effects, which may be particularly significant on the upper or lowermost stories for tall buildings. This effect can range from either strong inflow or strong outflow from all natural vents on a given storey.[2]

The IBC needs to provide more effective means to prevent smoke from entering critical exit stairwells in high-rise buildings. Properly designed stairwell pressurization prevents smoke from flowing back into the pressurized exit stairwells and smokeproof enclosures. The goal of this proposal is maintaining a tenable environment within the escape routes in the event of a building fire.

Bibliography:

1. Klote, J.H. and Milke, J.A. Fire Protection Handbook, NFPA 19th Edition, Volume II, Smoke Movement in Buildings, Chapter 6, Section 12-113 –12-126
2. Building Research Establishment, UK, Smoke Ventillation of Common Access Areas of Flats & Maisonettes (BD2410), Final Factual Report, Appendix A (Review), BRE Ltd, 2005

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

ICCFILENAME: CRIMI-F1-909.2.DOC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved the proposal for a couple reasons. First, it was felt that the proposed exception is best dealt with as an alternative method in accordance with Chapter 1. The second reason was concern with the inconsistency with terminology related to pressurized systems. Finally there was concern that there are other pressurization methods such as elevator pressurization that should be correlated with this section.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

909.2 (IBC [F] 909.2) General design requirements. Buildings, structures or parts thereof required by this code to have a smoke control system or systems, or a stair pressurization system shall have such systems designed in accordance with the applicable requirements of Section 909 and the generally accepted and well-established principles of engineering relevant to the design. The construction documents shall include sufficient information and detail to adequately describe the elements of the design necessary for the proper implementation of the smoke control systems. These documents shall be accompanied by sufficient information and analysis to demonstrate compliance with these provisions.

IBC 909.20.6.1 Ventilation systems. The ventilation system for smokeproof enclosures and pressurized stairways ~~ventilation systems~~ shall be independent of other building ventilation systems. The equipment, control wiring, power wiring and ductwork shall comply with one of the following:

1. Equipment, control wiring, power wiring and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or pressurized stairway or connected to the smokeproof enclosure or pressurized stairway by ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 708 or *horizontal assemblies* constructed in accordance with Section 712, or both.
2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure or pressurized stairway with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 708 or *horizontal assemblies* constructed in accordance with Section 712, or both.
3. Equipment, control wiring, power wiring and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour *fire barriers* constructed in accordance with Section 708 or *horizontal assemblies* constructed in accordance with Section 712, or both.

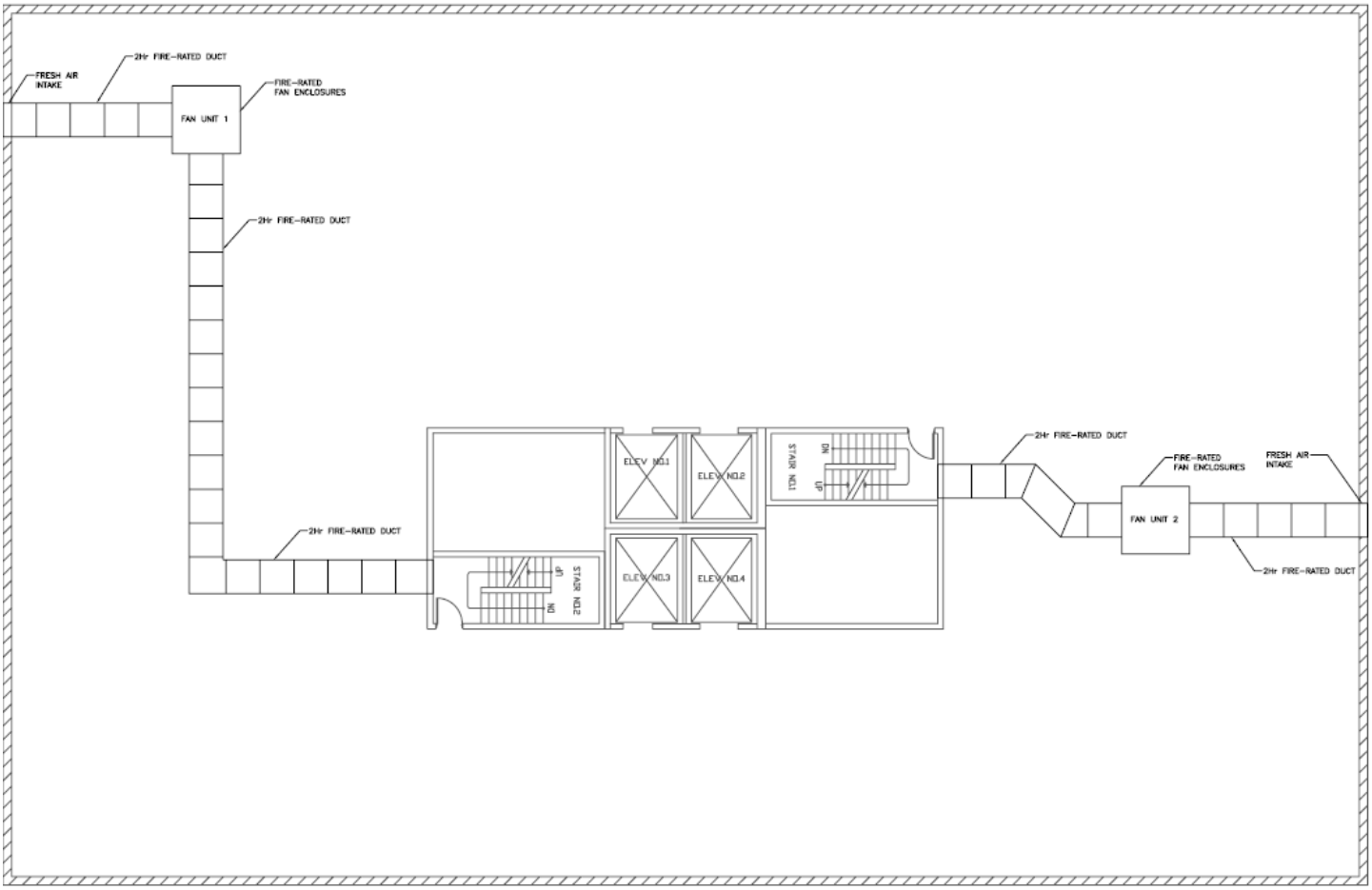
Exceptions:

1. Control wiring and power wiring utilizing a 2-hour rated cable or cable system.
2. Where encased with not less than 2 inches (51 mm) of concrete.
3. Ductwork shall be permitted to be protected using an approved alternative fire resistant ~~fire-resistive~~ duct ~~assembly~~ construction approved by the building official. ~~that is a *listed* and *labeled* specifically for such purpose~~.

Commenter's Reason: The purpose of a closed pressurization system is to provide fresh air directly to stairwells or egress areas. This proposal would require Stair pressurization systems to be designed in accordance with the existing requirements of section 909, and require ducts installed for the purposes of stairwell pressurization to be enclosed within a shaft enclosure or alternate construction approved by the building official, in accordance with the IBC.

Where stair pressurization is used, the design air pressures need to be sufficient to maintain closed doors while preventing smoke from entering the egress path. At the same time, the ducts and fans supplying the pressurized air to the Stairwells need to be protected in order to ensure that they can continue to function in the event of a fire in the remainder of the floor area. This is particularly critical because, even if installed, fire and/or smoke dampers are not closed during a fire emergence in a pressurization duct designed to supply air to the stairwell.

The illustration below shows a typical contemporary floor plate. Stairwells are not typically located on the exterior wall of a building. It is not unlikely that the ducts supply the pressurization will pass through the floor are, and possibly through fire resistance rated separations. The IBC needs to stipulate the design and protection required to ensure reliable operation of these systems during a fire event. Properly designed stairwell pressurization prevents smoke from flowing back into the pressurized exit stairwells and smokeproof enclosures.



TYPICAL FIRE-RATED STAIR PRESSURIZATION SYSTEM

Final Action: AS AM AMPC____ D

F135-09/10

909.3 (IBC [F] 909.3, IMC [F] 513.3), 909.18.8 (IBC [F] 909.18.8), 909.18.8.1 (IBC [F] 909.18.8.1), 909.18.8.2 (IBC [F] 909.18.8.2), 909.18.8.2.1 (IBC [F] 909.18.8.2.1), 909.18.8.2.2 (IBC [F] 909.18.8.2.2), 909.18.8.2.3 (IBC [F] 909.18.8.2.3); IBC [F] 1704.16, [F] 1704.16.1, [F] 1704.16.2

Proposed Change as Submitted

Proponent: Vickie Lovell, Representing National Energy Management Institute

1. Revise as follows:

909.3 (IBC [F] 909.3, IMC [F] 513.3) Special inspection and test requirements. In addition to the ordinary inspection and test requirements to which buildings, structures and parts thereof are required to undergo, smoke control systems subject to the provisions of Section 909 shall undergo special inspections and tests sufficient to verify the proper commissioning of the smoke control design in its final installed condition. The design submission accompanying the *construction documents* shall clearly detail procedures and methods to be used and the items subject to such inspections and tests. Such commissioning shall be in accordance with generally accepted engineering practice and, where possible, based on published standards for the particular testing involved. The special inspections and tests required by this section shall be conducted under the same terms as in Section 1704 of the International Building Code and Section 909.18 of this code.

909.18.8 (IBC [F] 909.18.8) Special inspections for smoke control. Smoke control systems shall be tested by a special inspector in accordance with the requirements for special inspections in Sections 909.18 through 909.19 and Section 909.20.6.3 of the *International Building Code*.

909.18.8.1 (IBC [F] 909.18.8.1) Scope of testing. Special inspections shall be conducted in accordance with the following:

1. During erection of ductwork and prior to concealment for the purposes of leakage testing and recording of device location.
2. Prior to occupancy and after sufficient completion for the purposes of pressure-difference testing, flow measurements, and detection and control verification.

909.18.8.2 (IBC [F] 909.18.8.2) Qualifications. Special inspection agencies for smoke control shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers, or be certified by a third party accreditation program for air testing, adjusting and air balancing and for inspection of smoke control systems. An approved special inspection agency shall provide all information as necessary for the building official to determine that the agency meets the applicable requirements and shall be qualified to conduct, supervise and evaluate tests and periodic inspections and maintenance.

909.18.8.2.1 (IBC [F] 909.18.8.2.1) Independence. An approved special inspection agency shall be objective, competent and independent from the contractor responsible for the work being inspected. The agency shall also disclose possible conflicts of interest so that objectivity can be confirmed.
909.18.8.2.2 (IBC [F] 909.18.8.2.2) Equipment. An approved special inspection agency shall have adequate equipment to perform required tests. The equipment shall be periodically calibrated.

909.18.8.2.3 (IBC [F] 909.18.8.2.3) Personnel. An approved special inspection agency shall employ experienced personnel educated in conducting, supervising and evaluating tests and inspections.

IBC [F] 1704.16 Special inspection for smoke control. Smoke control systems shall be tested by a special inspector in accordance with Section 909.18.8.

~~**IBC [F] 1704.16.1 Testing scope.** The test scope shall be as follows:~~

1. ~~During erection of ductwork and prior to concealment for the purposes of leakage testing and recording of device location.~~
2. ~~Prior to occupancy and after sufficient completion for the purposes of pressure difference testing, flow measurements and detection and control verification.~~

~~**IBC [F] 1704.16.2 Qualifications**. *Special inspection* agencies for smoke control shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers.~~

Reason: The purpose of this code change is to clarify and centralize the language as it relates to the qualifications of special inspectors and special inspection agencies of smoke control systems. This ties together the IBC, IFC, and IMC with consistent language as it relates to special inspections, testing and maintenance of smoke control systems.
909.3. This is an editorial change which adds the reference of the new language in Sections 909.18.
909.18.8. The addition of the referenced sections clarifies the intent of the code's requirement of special inspections, agencies, and inspectors.
909.18.8.2. through 909.18.8.2.3. This language is derived from Chapter 1703.1.1 of the 2009 IBC.

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

ICCFILENAME: LOVELL-F2-909.3

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this code change with concern that Section 909.18.8.2.1 did not include the engineer and only referenced the contractor. In addition it would be more appropriate to reference the fire code official versus the building official. Generally there was concern that allowing third party accreditation may lessen the testing requirements. It should be noted that the committee did like that the proposal coordinated the smoke control special inspection requirements between the IBC, IFC and the IMC.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Vickie Lovell, InterCode Incorporated, representing National Energy Management Institute, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

909.3 (IBC [F] 909.3, IMC [F] 513.3) Special inspection and test requirements. In addition to the ordinary inspection and test requirements to which buildings, structures and parts thereof are required to undergo, smoke control systems subject to the provisions of Section 909 shall undergo special inspections and tests sufficient to verify the proper commissioning of the smoke control design in its final installed condition. The design submission accompanying the *construction documents* shall clearly detail procedures and methods to be used and the items subject to such inspections and tests. Such commissioning shall be in accordance with generally accepted engineering practice and, where possible, based on published standards for the particular testing involved. The special inspections and tests required by this section shall be conducted under the same terms as in Section 1704 of the International Building Code and Section 909.18 of this code.

909.18.8 (IBC [F] 909.18.8) Special inspections for smoke control. Smoke control systems shall be tested by a special inspector in accordance with the requirements for special inspections in Sections 909.18 through 909.19 and Section 909.20.6.3 of the *International Building Code*.

909.18.8.1 (IBC [F] 909.18.8.1) Scope of testing. Special inspections shall be conducted in accordance with the following:

1. During erection of ductwork and prior to concealment for the purposes of leakage testing and recording of device location.
2. Prior to occupancy and after sufficient completion for the purposes of pressure-difference testing, flow measurements, and detection and control verification.

909.18.8.2 (IBC [F] 909.18.8.2) Qualifications. Special inspection agencies for smoke control shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers,or be certified by a third party accreditation program for air testing, adjusting and air balancing and for inspection of smoke control systems. An approved special inspection agency shall provide all information as necessary for the ~~building~~ fire code official to determine that the agency meets the applicable requirements and shall be qualified to conduct, supervise and evaluate the annual and semiannual operational test required by 909.20 ~~tests and periodic inspections and maintenance~~.

Exception: Periodic component inspection and maintenance shall be permitted to be performed by facility maintenance personnel, or personnel certified by a third party accreditation program for inspection and maintenance of the components of the system.

909.18.8.2.1 (IBC [F] 909.18.8.2.1) Independence. An approved special inspection agency shall be objective, competent and independent from the contractor responsible for the work being inspected. The agency shall also disclose possible conflicts of interest so that objectivity can be confirmed.

909.18.8.2.2 (IBC [F] 909.18.8.2.2) Equipment. An approved special inspection agency shall have adequate equipment to perform required tests. The equipment shall be periodically calibrated.

909.18.8.2.3 (IBC [F] 909.18.8.2.3) Personnel. An approved special inspection agency shall employ experienced personnel educated in conducting, supervising and evaluating tests and inspections.

IBC [F] 1704.16 Special inspection for smoke control. Smoke control systems shall be tested by a special inspector in accordance with Section 909.18.8.

(Portions of the proposal not shown remain unchanged.)

Commenter's Reason: The International Fire Code specifies in 909.20.1 that a routine inspection and maintenance program and an annual or semi annual operational testing program of the system be initiated immediately after the smoke control system has passed the acceptance tests. The IBC, IMC, IFC all have partial requirements as to who should be qualified to execute this work, which may be divided into two categories of work. One type of inspection is the ongoing system component maintenance which may be required regular inspections per the written schedule for routine maintenance. The other is annual or semiannual operational testing of the entire smoke control system.

This public comment combines the requirements of the IBC, IMC, IFC into one location in the IFC and makes a distinction between maintenance personnel, or otherwise qualified individuals who can perform routine inspections and maintenance and those who have the technical expertise to evaluate the operation and function of the entire smoke control system.

Final Action: AS AM AMPC____ D

F142-09/10
909.20

Proposed Change as Submitted

Proponent: Vickie Lovell, Representing National Energy Management Institute

Add new text as follows:

909.20 Maintenance. Smoke control systems shall be maintained to ensure to a reasonable degree that the system is capable of controlling smoke for the duration required. The maintenance and testing of the smoke control system shall be supervised by personnel who have expertise in fire protection engineering, mechanical engineering and certified as air balancers, or are certified by a third party accreditation program for air testing, adjusting and air balancing and for inspection of smoke control systems. The system shall be maintained in accordance with the manufacturer's instructions and Sections 909.20.1 through 909.20.5.

Reason: The purpose of this addition is to further clarify the requirements of those supervising individuals who test and maintain smoke control systems. Third-party accreditation programs provide individuals with the needed expertise in fire-protection engineering, mechanical engineering, and air adjusting and balancing.

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

ICCFILENAME: LOVELL-F3-909.20

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee felt that it would be too restrictive to require the proposed level of qualifications for the maintenance of approved smoke control systems.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Vickie Lovell, InterCode Incorporated, representing National Energy Management Institute, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

909.20 Maintenance. Smoke control systems shall be maintained to ensure to a reasonable degree that the system is capable of controlling smoke for the duration required. The annual and semiannual inspection and operational ~~maintenance and~~ testing of the smoke control system as required by 909.20.4 and 909.20.5 shall be supervised by personnel who have expertise in fire protection engineering, mechanical engineering and certified as air balancers, or are certified by a third party accreditation program for air testing, adjusting and air balancing and for inspection of smoke control systems. The system components shall be maintained in accordance with the manufacturer's instructions and Sections 909.20.1 through 909.20.5.

Commenter's Reason: The purpose of this public comment is to clarify that this requirement for qualified supervisory personnel is intended to fulfill the required annual and semiannual operational testing of the smoke control system. Routine component maintenance and testing may be performed by either a certified third-party or otherwise qualified individuals, such as facility maintenance personnel; however it is not required by this new code section.

Final Action: AS AM AMPC____ D

F144-09/10
910 (IBC [F] 910), 2306, Chapter 47 (IBC Chapter 35)

Proposed Change as Submitted

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

1. Revise as follows:

SECTION 910
SMOKE AND HEAT VENTS

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

section. The provisions of Section 910.3 shall only apply to buildings or portions thereof, which are not protected by an automatic sprinkler system. The provisions of Section 910.4 shall apply to buildings or portions thereof which are protected by an automatic sprinkler system in accordance with Section 903.3.1.1.

~~**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 shall not be required within these areas.~~

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

910.2.1 (IBC [F] 910.2.1) Group F-1 or S-1. ~~Buildings and portions thereof used as~~ A mechanical smoke removal system shall be installed in one story buildings or portions thereof used as a Group F-1 or S-1 occupancy exceeding 50,000 square feet. ~~having more than 50,000 square feet (4645 m^2) in undivided area.~~

~~**Exception:** Group S-1 aircraft repair hangars.~~

910.2.2 (IBC [F] 910.2.2) Nonsprinklered high-piled combustible storage. Smoke and heat vents and draft curtains shall be installed in one story buildings or portions thereof containing high-piled combustible storage ~~stock~~ which is not protected by an automatic sprinkler system ~~or rack storage in any occupancy group~~ in accordance with Section 2306.7.

910.2.3 (IBC [F] 910.2.3) Sprinklered high-piled combustible storage. A mechanical smoke removal system shall be installed in one story buildings or portions thereof containing high-piled combustible storage which is protected by an automatic sprinkler system in accordance with Section 413 and the *International Fire Code*.

910.3 (IBC [F] 910.3) Design and installation. The design and installation of smoke and heat vents and draft curtains in buildings which are not protected by an automatic sprinkler system shall be ~~as specified in Sections 910.3.1 through 910.3.5.2 and Table 910.3.~~ in accordance with NFPA 204 and this section.

~~**TABLE 910.3 (IBC [F] TABLE 910.3)**~~
~~**REQUIREMENTS FOR DRAFT CURTAINS AND SMOKE AND HEAT VENTS[a]**~~
(Delete table and notes in their entirety)

910.3.1 (IBC [F] 910.3.1) Smoke boundary layer. Smoke and heat vents and draft curtain installations shall be designed to maintain the elevation of the smoke boundary layer as defined by NFPA 204 a minimum of 6 feet above the elevation of the means of egress for a period of 20 minutes after effective ignition.

~~**910.3.1 (IBC [F] 910.3.1) Design.**~~ **910.3.2 (IBC [F] 910.3.2) Listing and labeling.** Smoke and heat vents shall be listed and labeled to indicate compliance with UL 793 or FM 4430..

~~**910.3.2 (IBC [F] 910.3.2) Vent operation.** 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 Sections 910.3.2.1 through 910.3.2.3.~~

~~**910.3.2.1 (IBC [F] 910.3.2.1) 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) Sprinklered buildings.** Where installed in buildings provided with an approved automatic sprinkler system, smoke and heat vents shall be designed to operate automatically.~~

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

~~**Exception:** Gravity-operated drop-out vents complying with Section 910.3.2.1~~

~~**910.3.3 (IBC [F] 910.3.3) 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**~~ **910.3.3 (IBC [F] 910.3.3 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 in the areas of the building where the vents are required to be installed by Section 910.2 with consideration given to roof pitch, draft curtain location, sprinkler location and structural members~~.

~~**910.3.5 (IBC [F] 910.3.5)**~~ **910.3.4 (IBC [F] 910.3.4 Draft curtains.** Where required by ~~Table 910.~~3 NFPA 204, draft curtains shall be 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 non ESFR sprinklers.

~~**910.3.5.1 (IBC [F] 910.3.5.1**~~ **910.3.4.1 (IBC [F] 910.3.4.1) 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) 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) Mechanical smoke exhaust.** Where approved by the fire code official, engineered mechanical smoke exhaust shall be an acceptable alternate to smoke and heat vents.~~
[F] 910.4. Mechanical smoke removal system. Where required by Sections 910.2.1 and 910.2.3, a mechanical smoke removal system shall be provided in accordance with this section.

Exception: Buildings or portions thereof which are protected by ESFR sprinklers.

~~**910.4.1 (IBC [F] 910.4.1) Location.** Exhaust fans shall be uniformly spaced within each draft-curtained area and the maximum distance between fans shall not be greater than 100 feet (30 480 mm).~~

910.4.1 (IBC [F] 910.4.1) Exhaust fan number and spacing. A minimum of two exhaust fans shall be provided. The spacing between exhaust inlets shall be a minimum of 40 feet and not exceed 100 feet.

~~**910.4.2 (IBC [F] 910.4.2) Size.** Fans shall have a maximum individual capacity of 30,000 cfm (14.2 m3/s). The aggregate capacity of smoke exhaust fans shall be determined by the equation:~~

~~$C = A \times 300$ **(Equation 9-10)**~~

~~where:~~

~~C = Capacity of mechanical ventilation required, in cubic feet per minute (m3/s).~~
~~A = Area of roof vents provided in square feet (m2) in accordance with Table 910.3.~~

910.4.2 (IBC [F] 910.4.2) Exhaust fan construction. Exhaust fans which are part of the smoke removal system shall be rated for operation at ambient temperatures. Exhaust fan motors shall be located outside of the exhaust air stream.

910.4.2 (IBC [F] 910.4.3) System design criteria. The mechanical smoke removal system shall be sized to exhaust the building at a minimum rate of 4 air changes per hour based upon the volume of the building or portion thereof without contents. The capacity of each exhaust fan shall not exceed 30,000 cubic feet per minute. Adequate make-up air shall be available and approved.

~~**910.4.3 (IBC [F] 910.4.3) 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 in Section 910.3.2. Individual manual controls of each fan unit shall also be provided.~~

910.4.4 (IBC [F] 910.4.4) Activation. The mechanical smoke removal system shall be activated by manual controls. The mechanical smoke removal system shall not be automatically activated.

910.4.5 (IBC [F] 910.4.5) Manual control location. Manual controls shall be located so as to be accessible to the fire service from the exterior of the building and be protected against interior fire exposure by not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

~~**[F] 910.4.4 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°C) for a period of not less than 15 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.~~

910.4.6 (IBC [F] 910.4.6) Wiring and control. Wiring for the operation and control of smoke removal system fans shall be connected ahead of the main disconnect and be protected by materials with a finish rating of 30 minutes.

~~**910.4.5 (IBC [F] 910.4.5) 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 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) 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.~~

910.4.7 (IBC [F] 910.4.7) Interlocks. Where building air-handling and smoke removal systems are combined or where independent building air-handling systems are provided, fans shall automatically shut down in accordance with the *International Mechanical Code*. The manual controls provided for the smoke removal system shall have the cability to override the automatic shutdown of fans that are part of the smoke removal system.

TABLE 2306.2
GENERAL FIRE PROTECTION AND LIFE SAFETY REQUIREMENTS

COMMODITY CLASS	SIZE OF HIGH-PILED STORAGE AREA[a] (square feet) (see Sections 2306.2 and 2306.4)	ALL STORAGE AREAS (See Sections 2306, 2307 and 2308)[b]				
		Automatic fire-extinguishing system (see Section 2306.4)	Fire detection system (see Section 2306.5)	Building access (see Section 2306.6)	Smoke and heat ~~removal~~ venting (see Section 2306.7)	~~Draft curtains (see Section 2306.7)~~
I-IV	0-500	Not Required[a]	Not Required	Not Required[e]	Not Required	~~Not Required~~
	501-2,500	Not Required[a]	Yes[i]	Not Required[e]	Not Required	~~Not Required~~
	2,501-12,000 Public accessible	Yes	Not Required	Not Required[e]	Not Required	~~Not Required~~
	2,501-12,000 Nonpublic accessible (Option 1)	Yes	Not Required	Not Required[e]	Not Required	~~Not Required~~
	2,501-12,000 Nonpublic accessible (Option 2)	Not Required[a]	Yes	Yes	Yes	~~Yes~~[i]

COMMODITY CLASS	SIZE OF HIGH-PILED STORAGE AREA[a] (square feet) (see Sections 2306.2 and 2306.4)	ALL STORAGE AREAS (See Sections 2306, 2307 and 2308)[b]				
		Automatic fire-extinguishing system (see Section 2306.4)	Fire detection system (see Section 2306.5)	Building access (see Section 2306.6)	Smoke and heat ~~removal~~ venting (see Section 2306.7)	~~Draft curtains (see Section 2306.7)~~
	12,001-20,000	Yes	Not Required	Yes	Yes[j]	~~Not Required~~
	20,001-500,000	Yes	Not required	Yes	Yes[l]	~~Not required~~
	Greater than 500,000 ~~g~~ d	Yes	Not required	Yes	Yes[l]	~~Not required~~
High hazard	0-500	Not Required[a]	Not Required	Not Required[e]	Not Required	~~Not Required~~
	501-2,500 Public accessible	Yes	Not Required	Not Required[e]	Not Required	~~Not Required~~
	501-2,500 Nonpublic accessible (Option 1)	Yes	Not Required	Not Required[e]	Not Required	~~Not Required~~
	501-2,500 Nonpublic accessible (Option 2)	Not Required[a]	Yes	Yes	Yes	~~Yes~~[j]
	2,501-300,000	Yes	Not required	Yes	Yes[j]	~~Not required~~
	300,001-500,000 ~~g~~ d,h	Yes	Not required	Yes	Yes[l]	~~Not required~~

(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm, 1 cubic foot = 0.02832 m^3 , 1 square foot = 0.0929 m^2 .

a. When automatic sprinklers are required for reasons other than those in Chapter 23, the portion of the sprinkler system protecting the high-piled storage area shall be designed and installed in accordance with Sections 2307 and 2308.
b. For aisles, see Section 2306.9.
c. Piles shall be separated by aisles complying with Section 2306.9.
d. For storage in excess of the height indicated, and high hazard storage areas greater than 300, 000 square feet, ~~special fire protection~~ an approved engineering design such as fire protection of structural elements and enhanced fire suppression shall be provided ~~in accordance with Note g when required by the fire code official~~. See also Chapters 28 and 34 for special limitations for aerosols and flammable and combustible liquids, respectively.
e. Section 503 shall apply for fire apparatus access.
f. For storage exceeding 30 feet in height, Option 1 shall be used.
~~g. Special fire protection provisions including, but not limited to, fire protection of exposed steel columns; increased sprinkler density; additional in-rack sprinklers, without associated reductions in ceiling sprinkler density; or additional fire department hose connections shall be provided when required by the fire code official.~~
h. High-piled storage areas shall not exceed 500,000 square feet. A 2-hour fire wall constructed in accordance with the International Building Code shall be used to divide high-piled storage exceeding 500,000 square feet in area.
i. Not required when an automatic fire-extinguishing system is designed and installed to protect the high-piled storage area in accordance with Sections 2307 and 2308.
j. Smoke and heat venting shall not be ~~Not~~ required when storage areas are protected by early suppression fast response (ESFR) sprinkler systems installed in accordance with NFPA 13. Where a standard sprinkler system is installed in these locations, a mechanical smoke removal system shall be provided in accordance with Section 910.4. See Section 2306.7.

2306.7 Smoke and heat ~~removal~~ venting. Where smoke and heat ~~removal~~ venting ~~are~~ is required by Table 2306.2 in buildings not protected by an automatic sprinkler system, smoke and heat vents and draft curtains shall be provided in accordance with Section 910. Smoke and heat venting shall not be required where storage areas are protected by early suppression fast response (ESFR) sprinkler systems installed in accordance with NFPA 13. Where Table 2306.2

requires smoke and heat venting in a building with a standard sprinkler system, a mechanical smoke removal system shall be provided in accordance with Section 910.4. Where draft curtains are required by Table 2306.2, they shall be provided in accordance with Section 910.3.4.

2. Add new standards to Chapter 47 (IBC Chapter 35) as follows:

FM
4430-07 Approval Standard for Heat and Smoke Vents

NFPA
204-2010 Standard for Smoke and Heat Venting

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

This proposed change is a result of the CTC's investigation of the area of study entitled "Balanced Fire Protection – Roof vents". The scope of the activity is noted as:

Review the current IBC/IFC requirements for smoke/heat vents and draft curtains relative to balanced fire protection**.**

The purpose of this code change is to update the provisions which mandate roof vents in one-story industrial and storage buildings. The code change will delete the specification-oriented provisions for roof vents and draft curtains for unsprinklered buildings and substitute a reference to NFPA 204. The code change will further require that a manually-operated mechanical smoke removal system be provided for large one-story industrial and storage buildings protected by a sprinkler system in lieu of the requirements for roof vents and draft curtains.

The first issue assigned by the ICC Board of Directors to the Code Technology Committee (CTC) in 2005 was the issue of "balanced" fire protection. As part of the CTC's review of the "balanced" fire protection issue, the CTC formed a Study Group to review the issue of whether or not smoke/heat vents were necessary in large buildings protected by a sprinkler system.

After reviewing the available research on the interaction of standard sprinklers and roof vents (NISTIR 6196-1), it was determined that individually-activated automatic roof vents are unlikely to activate automatically in buildings protected by standard spray sprinklers (provided that the sprinkler system is adequate for the hazard protected and is operational). Given this determination, it was concluded that the performance of individually-activated automatic roof vents is essentially the same as manually-operated roof vents in buildings protected by a sprinkler system.

The explanatory information provided in NFPA 204 indicates that the capabilities of roof vents to perform their function are dependent upon the depth of the smoke layer which develops and the temperature differential between the smoke layer and ambient temperature. Given that standard spray sprinklers are highly efficient in reducing ceiling temperatures due to the finely divided water spray produced by these types of sprinklers, the ceiling temperatures produced even in "high challenges" fires are rapidly reduced and, after about 10 minutes of sprinkler discharge, return to near ambient and continue to drop with additional time. Based upon this, it can be concluded that roof vents which are manually opened 10 minutes or more after sprinkler activation will not provide effective venting for the building.

Where the smoke layer temperature differentials are less than 110^{o}C (198^{o}F), NFPA 204 recommends that a powered (mechanical) exhaust system be provided in lieu of providing roof vents. Based upon the recommendations contained in NFPA 204, the provisions for providing roof vents have been deleted and a requirement for a manually-operated mechanical smoke removal system has been substituted.

The proposal requires that the manually-operated mechanical smoke removal system be sized to provide a minimum of 6 air changes per hour. Since the use of roof vents for the purpose of providing venting in sprinklered buildings has been acceptable for over 25 years, the sizing of the mechanical smoke removal system has been determined based upon the venting capabilities of roof vents at a time equal to the typical fire department response time, 10 minutes and beyond. Given that opened roof vents will provide little actual venting capability after the sprinkler system has been discharging water spray for 10 minutes, providing a mechanical smoke removal system which provides a minimum of 4 air changes an hour will be a substantial improvement over the presently acceptable venting capabilities for sprinklered buildings required by the IBC/IFC. The 4 air changes were viewed as a reasonable value when compared against the BOCA National Building Code which required 2 and the Uniform Building Code which required 6.

It should be noted that this code change proposal permits the mechanical smoke removal system to designed to operate at ambient temperatures. The rationale for this provision is that the ceiling temperatures throughout the building will be returned to close to ambient at between 10 and 15 minutes after the first sprinkler activates. Given that the typical response time for fire departments is roughly 10 minutes, and the ceiling temperatures expected after 10 minutes, there is no need to design the mechanical system to withstand temperatures higher than ambient.

In the opinion of the Study Group which has developed this code change proposal, the proposal is a vast improvement over the existing provisions for roof venting presently contained in the IBC/IFC.

It should be noted that simply making a reference to NFPA 204 as a substitute for the present specification-oriented provisions for roof vents/draft curtains contained in the IBC/ IFC is not an option because the current edition of NFPA 204 does not contain specific design provisions for the design of roof vent systems in buildings protected by a standard sprinkler system. Without specific provisions for roof vent system in sprinklered buildings, the requirements for roof vent systems in sprinklered buildings cannot be enforced in a uniform manner in all jurisdictions which utilize the IBC/IFC.

It should also be noted that the NFPA 204 committee is presently working developing provisions which address the design of roof venting systems in sprinklered buildings; however, these provisions have been under development for more than 30 years. It is the Study Group's opinion that the IBC/IFC should not be written based upon the assumption that the NFPA 204 committee will be able to develop provisions for the design of venting systems anytime in the near future.

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, FM 4430-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009. Review of proposed new standard NFPA 204-2010 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

ICCFILENAME: HEILSTEDT-F1-910.1.DOC

Public Hearing Results

Note: The following analysis was not in the Code Change monograph but was published on the ICC website at http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf :

Analysis: Review of proposed new standard NFPA 204-2010 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria in terms of the availability of a consensus draft for the committee hearing. Note that section 3.6.3.1 of CP28-05 requires that the standard be completed and readily available prior to Final Action Consideration. The final action of this proposal will occur May 14-23, 2010.

Review of the proposed standard FM 4430-07 indicated that in the opinion of ICC Staff the standard did not comply with ICC standards criteria. More specifically the standard did not meet the consensus process of requirement of Section 3.6.3.2 of CP28-05.

Committee Action: Approved as Modified

Modify proposal as follows:

910.2.1 (IBC [F] 910.2.1) Group F-1 or S-1 -A mechanical smoke removal system shall be installed in ~~one-story~~ buildings or portions thereof used as a Group F-1 or S-1 occupancy exceeding 50,000 square feet.

910.2.3 (IBC [F] 910.2.3) Sprinklered high-piled combustible storage. ~~.~~ A mechanical smoke removal system shall be installed in ~~one-story~~ buildings or portions thereof containing high-piled combustible storage which is protected by an automatic sprinkler system in accordance with Section 413 and the *International Fire Code*.

[F] 910.4. Mechanical smoke removal system. Where required by Sections 910.2.1 and 910.2.3, a mechanical smoke removal system shall be provided in accordance with this section.

Exceptions:

1. Buildings or portions thereof which are protected by ESFR sprinklers.
2. Buildings equipped with smoke and heat vents designed in accordance with NFPA 204, when permitted by NFPA 13.

910.4.6 (IBC [F] 910.4.6) Wiring and control. Wiring for the operation and control of smoke removal system fans ~~shall be connected ahead of the main disconnect~~ provided with power in accordance with Section 909.11 and be protected by materials with a finish rating of ~~30 minutes~~ not less than 1 hour.

2306.7 Smoke and heat venting. Where smoke and heat venting is required by Table 2306.2 in buildings not protected by an automatic sprinkler system, smoke and heat vents and draft curtains shall be provided in accordance with Section 910. Smoke and heat venting shall not be required where storage areas are protected by early suppression fast response (ESFR) sprinkler systems installed in accordance with NFPA 13. Where Table 2306.2 requires smoke and heat venting in a building with a standard sprinkler system, ~~a mechanical~~ smoke removal ~~system~~ shall be provided in accordance with Section 910.4. Where draft curtains are required by Table 2306.2, they shall be provided in accordance with Section 910.3.4.

Revise Table 2306.2 Note j as follows:

j. Smoke and heat venting shall not be required when storage areas are protected by early suppression fast response (ESFR) sprinkler systems installed in accordance with NFPA 13. Where a standard sprinkler system is installed in these locations, ~~a mechanical~~ smoke removal ~~system~~ shall be provided in accordance with Section 910.4. See Section 2306.7.

NFPA

204-~~2010~~ 2007 Standard for Smoke and Heat Venting

(Portions of the proposal not shown remain unchanged)

Committee Reason: The committee approved the proposal with amendments as it was felt that a major revision to this section was necessary. The proposal essentially requires mechanical smoke removal in sprinklered buildings and using smoke and heat vents in unsprinklered buildings. There were four major modifications to this code change. The first removed the phrase “one-story” from sections 910.2.1 and 910.2.3 as mechanical smoke removal does not need to be limited to ‘one story” buildings as smoke and heat venting is limited. The second modification increases the rating of the wiring for the smoke removal system from 30 minutes to 1 hour and also requires standby power and some associated passive protection of such power supplies in accordance with Section 909.11. Members of the committee felt smoke removal systems are critical emergency systems that need additional protection even in buildings where sprinklers are operating. The third modification recognizes some situations that are permitted by NFPA 13 to allow smoke and heat vents in sprinklered buildings. Allowing smoke and heat vents as an option when appropriate was felt to be necessary. This revision adds a new exception to Section 910.4 to allow this in lieu of smoke removal systems. In addition, Section 2306.7 and footnote j to Table 2306.2 makes the reference to smoke removal more general to be inclusive of mechanical smoke removal and smoke and heat vents. The fourth modification changes the referenced edition of NFPA 204 from the 2010 edition to the 2007 edition. The reason for the change of edition years relates to the fact that the 2010 edition is likely not to be available prior to the final action hearings.

Assembly Action: None

Individual Consideration Agenda

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

Public Comment 1:

Richard Schulte representing Schulte & Associates, requests Approval as Submitted.

Commenter's Reason: The reason for submitting this public comment is that it is Schulte & Associates' opinion that testimony heard in support of the modification to this code change proposal made by William Koffel, Koffel & Associates, was factually in error and, hence, the code changes committee was misled into believing that it is the intent of the 2010 edition of NFPA 13 to consider that the installation of roof vents "***is a viable technology in sprinklered buildings***".

It is also Schulte & Associates' opinion that the code changes committee was further misled by testimony provided by William Koffel that the next edition of NFPA 204 will contain a "methodology" for designing roof vent/draft curtain systems in buildings protected by a sprinkler system.

The text of William Koffel's testimony on the modification to code change proposal F144-09/10 is as follows:

> *"To the modification. As Carl* [Baldassarra] *said, the name of this committee is Code Technology Committee, but their proposal is eliminating a technology that has been used for years without adequate substantiation. So, the nature of our modification is merely in sprinklered buildings to give the option using mechanical system or to use vents as we've used for a number of years.*
>
> *Now, in their supporting statement, they identify several reasons for doing this. In the second to the last paragraph on the first page of their substantiation, they indicate that the differential on the smoke temperatures will be approximately 198°F. I don't see where they came up with that. In fact, Carl stood here earlier and said that the test to determine adequate sprinkler performance is that temperatures do not threaten the structural steel system. That's substantially higher than the temperatures that they just referenced here. And in fact, NFPA 13 encourages the use of high temperature, 286°F sprinklers, in this type of occupancy. So, we clearly could have temperatures in excess of what they've identified. Secondly, they talk about a recommendation of the NFPA 204 committee. I sit on the NFPA smoke management committee responsible for 204. I'm not representing that committee here. I sit on NFPA 13 discharge criteria committee which is responsible for Chapter 12. I'm not representing that committee. But I think this committee needs to know that NFPA 13 now allows vents and draft curtains in buildings protected throughout with a sprinkler system. In fact, they've even gone so far to allow it in a building with ESFR sprinklers, smoke vents that is, if the vents have a certain criteria. That's in Chapter 12 of the 2010 edition of NFPA 13.* ***So the 13 committee recognizes that this is a viable technology in sprinklered buildings.*** [Emphasis added.] *204 has a proposal, or a comment, that is being balloted now that has a new chapter for designing smoke vents in buildings protected with a sprinkler system, so the technology is being addressed by the appropriate NFPA committees. Thank you.*

The issue of whether roof vents should be required in buildings protected by a sprinkler system was first discussed at the Code Technology Committee (CTC) meeting held in Detroit in late September 2005. The CTC voted to form a study group on the issue of roof vents as part of the CTC's study of the "balanced fire protection" issue at its meeting in Kansas City in October 2006. The study group began its work in January 2007 and it quickly became apparent (in my opinion) that the representatives of the Smoke Vent Task Group, Dr. Craig Beyler and Rick Thornberry, intended to delay the work of the study group for as long as possible.

At the CTC meeting held in Cincinnati in June 2007, the CTC voted to hold a debate over the issue of the use of roof vents in buildings protected by a sprinkler system in order to "break the logjam" created by Messrs. Thornberry and Beyler. Each side in the debate was given 30 minutes to make a presentation to the CTC. The debate before the CTC took place in Baltimore in late May 2008. Given the lack of time available for discussion at the meeting in Baltimore, the debate was repeated at the next CTC meeting held in Chicago in November 2008.

Speaking for the Smoke Vent Task Group, Dr. Craig Beyler, Hughes Associates, Inc. (HAI), presented HAI's research on the concept of the automatic "ganged" operation of roof vents (60 seconds after sprinkler system water flow is detected) to the CTC. This research relied on a fire modeling study of the interaction between sprinklers and roof vents. The "validation" of the fire model used in HAI's research was challenged and it was eventually determined that the use of the fire model, the Fire Dynamics Simulator (FDS), was not "validated" for the purpose the model was utilized by HAI. In a Smoke Vent Task Group teleconference held on March 24, 2009, the SVTG characterized HAI's fire modeling study as "***worthless***" and both of the SVTG's representatives to the CTC Roof Vent Study Group appear to have been dismissed by the Smoke Vent Task Group some time during 2009.

(**Source:** Minutes of the Smoke Vent Task Group Conference Call-Tuesday, March 24, 2009; 2009 AAMA 72nd Annual Conference, February 22-25, 2009-Revised as of May 11, 2009. See the notes at the end of this comment for the exact text indicating that the research work done by Hughes Associates, Inc. is "***worthless***".)

Based upon direction by the CTC provided at its November, 2008 meeting, the Roof Vent Study Group developed what became code change F144-09/10. The CTC's direction to the Study Group was that the code change proposal should reference NFPA 204.

Given that the latest edition of NFPA 204, the 2007 edition, does not contain any mandatory provisions for the design of roof vent/draft curtain systems in buildings protected by a sprinkler system, the Study Group developed a code change proposal which references NFPA 204 for the design of roof vent/draft curtain systems in buildings which are not protected by a sprinkler system and requires a manually-activated mechanical smoke removal system for buildings protected by a sprinkler system. Providing a mechanical smoke removal system is in accordance with the provisions contained in NFPA 204 which state that a mechanical smoke removal system should be considered, rather than roof vents, where the differential between the (**average**) temperature of the smoke layer and ambient temperature is less than 100°C (198°F).

The code change proposal developed by the Roof Vent Study Group/CTC contains no provisions for the use of roof vent systems in buildings protected by a sprinkler system. **Over the course of the three years in which the Roof Vent Study Group has been in existence, neither the Smoke Vent Task Group, the consultants retained by the SVTG or other interested parties submitted any documentation or testing which demonstrated that roof vent systems in buildings protected by a sprinkler system actually "work".**

In 1997/1998, a research study of the interaction between sprinklers and roof vents funded by the National Fire Protection Research Foundation (NFPRF) and conducted at Underwriters Laboratories (UL) determined that it was unlikely that thermally-activated automatic roof vents would open if the temperature rating of the activating device was the same (or greater than the) temperature rating of the sprinklers. More specifically, **Test P-2** in a series of five large-scale fire tests which were conducted as part of this research demonstrated that even if the ignition point of the fire was directly beneath an automatic roof vent, a vent may fail to open due to the activation of sprinklers in the vicinity of the vent. (The final report on this research can be found in a document referred to as **NISTIR 6196-1** dated September 1998. The title of this report is "Sprinkler, Smoke & Heat Vent, Draft Curtain Interaction-Large Scale Experiment and Model Development". The authors of this report were Kevin B. McGrattan, Anthony Hamins and David Stroup of NIST. The summary and discussion of Test P-2 begins on page 42 of this report.)

In response to the published report on the UL/NFPRF research, the chairman of the Smoke Vent Task Group, Paul Simony, issued a memorandum in early September 1999 which made a commitment to fund additional research into the interaction of sprinklers and roof vents. After 10-1/2 years, the research announced in September 1999 has yet to begin.

In the Summer 2006 issue of the AAMA newsletter, AAMAnet.work, the Smoke Vent Task Group announced that a contract had been awarded to Hughes Associates, Inc. to conduct fire modeling "***to concretely demonstrate the value of S&HV*** [smoke and heat vents] ***in terms of property protection, occupant safety, firefighter safety, and firefighter effectiveness***". The findings of this research were released in a report titled

"*Analysis of the Performance of Ganged Operation of Smoke and Heat Vents with Sprinklers and Draft Curtains*" dated February 18, 2008, however, the "validation" of the fire model, the Fire Dynamics Simulator (FDS), for the purposes utilized in the research was challenged (by Schulte & Associates and others) and Hughes Associates, Inc. was unable to demonstrate that the FDS has been "validated" for the purposes which the FDS was used. Hence, Hughes Associates, Inc.'s client, the Smoke Vent Task Group has characterized the fire modeling study which was to *"concretely demonstrate the value of S&HV*" as "***worthless***".

(**Source:** Minutes of the Smoke Vent Task Group Conference Call-Tuesday, March 24, 2009; 2009 AAMA 72nd Annual Conference, February 22-25, 2009-Revised as of May 11, 2009. See the notes at the end of this comment for the exact text indicating that the research work conducted by Hughes Associates, Inc. is "***worthless***".)

In a meeting of the CTC Balanced Fire Protection Study Group held at the Orange County Fire Authority (OCFA) in January 2007, Rick Thornberry, representing the Smoke Vent Task Group, announced that the SVTG would conduct testing of the concept of the "ganged" operation of roof vents in an aircraft hangar scheduled for demolition located on the Marine Corps Base in Orange County, California in conjunction with the OCFA. Later in 2007, Rick Thornberry announced that the planned research had been cancelled because of a lack of agreement regarding the use of the aircraft hangar with the United States Navy and that there were no other plans to conduct further research due to the problem of finding a suitable building and compliance with air pollution regulations.

In summary, in the 11-1/2 years since the findings of the UL/NFPRF study were published, the manufacturers of roof vents have made three commitments to conduct additional studies and research on the interaction of roof vents and sprinklers, but have not honored any of these commitments. (One of those commitments did result in "***worthless***" research, however.) In other words, the 1998 finding that the operation of sprinklers interferes with the openings of roof vents remains uncontested by any additional research. Further, Dr. Craig Beyler, formerly a representative for the Smoke Vent Task Group, has stated on a number of occasions since September 1998 that the number of thermally-activated roof vents which will open automatically in a fire in a building protected by a sprinkler system will be either 0 or 1 (if the sprinkler system effectively controls the fire).

Recently, the NFPA 13 committee has addressed the issue of the installation of roof vents in buildings protected by a sprinkler system. The original proposal considered by the NFPA 13 subcommittee published in the ROP document dated **October 20, 2007** reads as follows:

> "**12.1.1** *Roof Vents and Draft Curtains. Roof vents and draft curtains shall **not** be used in conjunction with the sprinkler protection criteria for storage in this standard.*

This original 2007 proposal was amended to its final form for inclusion in the 2010 edition of NFPA 13. The substantiation for the provisions addressing roof vents included in the 2010 edition of NFPA 13 reads as follows:

> "**Substantiation:** *The intent of the standard is that roof vents and draft curtains should **not** be used in conjunction with storage protection. Previous language was unenforceable.*"

In addition to the above, an "Explanation of Negative" comment submitted on the proposal which addresses the use of roof vent systems in buildings protected by a sprinkler system reads as follows:

> **MULTER, T.:** *The following original proposal on ROP documents dated 10/20/2007 should be accepted as proposed but with a change to the annex statement. . . .*
>
> **A.12.1.1** *The design parameters in NFPA 13 were developed based upon the absence of roof vents or draft curtains. (See Annex C.6) Fire tests for sprinklers specifically listed for storage applications are tested without vents or draft curtains. References to control mode sprinklers in other building standards pertain to standard spray sprinklers that were not specifically tested by the laboratories for storage applications. With the advent of K-11.2 and larger sprinklers for storage applications and now Specific Application Control Mode sprinklers (being revised to CMSA), we need to realize that ESFRs are not the only storage sprinklers and that **the use of smoke vents and draft curtains can be detrimental to all sprinklers that are specifically tested for storage applications.** FM Global's recommended storage protection designs are based upon vents not being provided and that the use of automatic vents may increase the sprinkler water demand.*"
>
> (**Source:** [NFPA] 13-325 Log #CP43 AUT-SSD Final Action: Accept; **Submitter:** *Technical Committee on Sprinkler System Discharge Criteria*)

Given all of the information above, it would be difficult to conclude anything but that William Koffel's statement that *"**this is a viable technology in sprinklered buildings**"* in his testimony at the code development hearings in Baltimore was misinformation. Given the fact that William Koffel is (and was) a member of the NFPA 13 sub-committee which developed the NFPA 13 provisions addressing roof vents and that he cast ballots on these proposals, it is also not too difficult to conclude that William Koffel's statement was intentional disinformation. (It should be noted that an ethics complaint against William Koffel based upon his testimony in the code development hearings in Baltimore was filed with the ICC in January, 2010.)

Regarding William Koffel's statements that "***204 has a proposal, or a comment, that is being balloted now that has a new chapter for designing smoke vents in buildings protected with a sprinkler system, so the technology is being addressed by the appropriate NFPA committees***", two special expert members of the NFPA Smoke Management Committee submitted the following comments regarding the proposed "methodology" for utilizing roof vents/draft curtains in buildings protected by a sprinkler system:

> ***DILLON, M.:*** *The document **prematurely and improperly** requires and relies upon unproven methods of calculation for the effectiveness of smoke and heat vents in the presence of automatic water-based sprinkler protection systems. **It also relies on calculations of questionable accuracy to determine activation times for the vents and the sprinklers.***
>
> ***WOLIN, S.:*** *While the proposal would substantially increase the amount of text in Chapter 11, I do not believe that the proposed revisions provide any significant guidance on the use of smoke and heat vents in sprinklered buildings that would not otherwise be addressed in the performance analysis that is already required. . . .*
>
> **(Source:** [NFPA] 204-1 Log #5, Report on Comments, June 2010.)

While the comments above made by Messrs. Dillon and Wolin were published after William Koffel's testimony, these comments are essentially the same comments made 6 months prior to the code development hearings in Baltimore by Messrs. Kenneth Isman, representing the National Fire Sprinkler Association (NFSA), and Richard Schulte, Schulte & Associates.

The following are excerpts from comments made by Messrs. Isman and Schulte in the spring of 2009:

ISMAN, K.: *We have seen extremely knowledgeable and experienced users of FDS be completely incapable of correctly predicting the number of sprinklers that would open and the opening time of these sprinklers in dry-pipe systems prior to arrival of water. If experienced users of FDS can't predict the situation correctly with no water flowing, how can we rely on data generated after water flow has arrived?*

Even if Dr. Beyler is capable of making sufficient adjustments to the FDS program to correctly predict sprinkler response times and locations, we have concerns about the average user of FDS being able to make this technological leap. According to the proposed section 11.3.2, the FDS model (or something equivalent) needs to be used to make section 11.2 work. ***We question whether the state-of-the-art in fire protection is ready for this step.***

SCHULTE, R.: *The capabilities of the Fire Dynamics Simulator to accurately predict the activation times of multiple sprinklers and the number of sprinklers which will activate is certainly questionable at best. At this point in time, it appears that the only "expert" who contends that these capabilities of the FDS have been "totally" validated (validation without any limitations) is Dr. Craig Beyler of Hughes Associates. To my knowledge, no other researcher or user of the FDS, including other employees of Hughes Associates, such as Dr. Jason Floyd, have come forward to support Dr. Beyler's assertions regarding the validation of these capabilities of the Fire Dynamics Simulator since late May, 2008 (when the question regarding validation of the FDS for the purpose used in the research first surfaced).*

With respect to the issue of validation of the FDS to accurately predict the activation times of multiple sprinklers and the number of sprinkler activations, Dr. Kevin McGrattan of the Building and Fire Research Laboratories (BFRL) at NIST responded to questions regarding the validation of the FDS for these purposes on the FDS Bulletin Board on February 17, 2009 as follows:

"*. . . . there is* ***no consensus*** *metric in fire protection engineering by which a model is considered validated or not for a particular application. . . .All large scale fire experiments have a considerable amount of uncertainty in the reported heat release rate, environmental conditions, sprinkler characteristics (like droplet size, RTI, etc), and various other parameters that are input into the fire model. Because of the complexity of the experiments and simulations of fires in large warehouse type facilities, especially those involving multiple sprinkler activations, we do not have a good way (yet) of quantifying the experimental uncertainty. It might be as hard to do that as to predict the experimental results themselves. . . .****But I hope you understand that I simply cannot make a blanket statement like "FDS is validated for predicting multiple sprinkler activations.***"

(**Source:** [NFPA] 204-6 Log #1; Report on Comments A2010)

Given that William Koffel is a member of the NFPA Smoke Management Committee and is listed on the roster of committee members as representing the Smoke Vent Task Group, there can be little doubt that William Koffel reviewed the comments by Messrs. Isman and Schulte. Hence, it seems reasonable to assume that William Koffel is and was aware that the "methodology" for utilizing roof vent systems in building protected by a sprinkler system was considered to be questionable at the time of his testimony in the code development hearings. Once again, the above demonstrates that William Koffel's testimony was at best misinformation and, more than likely, intentional disinformation.

Subsequent to the code development hearings held in Baltimore, William Koffel has now been named as the representative of the Smoke Vent Task Group for purposes of participation in the ICC code development process. In the latest two teleconferences, one held on January 22, 2010 and another held on February 2, 2010, William Koffel no longer asserts that roof vents "work" in buildings protected by a sprinkler system, however, William Koffel has asserted that manually-activated roof vents can be used as a source of make-up air for exhaust fans provided and deployed by the fire service and that manually-activated roof vents are equivalent to the manually-activated smoke removal system proposed in code change proposal F144-09/10. (It should be noted that William Koffel has yet to concede that roof vents do **not** "work" in buildings protected by a sprinkler system, at least in the two teleconferences addressed above.)

Are manually-operated roof vents really the equivalent of a manually-activated smoke removal system? In order to open manually-activated roof vents, it is necessary for fire fighters to go onto the roof and individually open each roof vent and, since cold smoke does not rise, fire fighters must also deploy portable exhaust fans at the floor of the building (or attempt positive pressure ventilation). A manually-activated mechanical smoke removal system is activated by a switch located in an approved location and does not require that fire fighters go onto the roof or deploy portable exhaust fans. Obviously, from the standpoint of fire fighter safety, the level of safety provided by a manually-activated mechanical system far exceeds that provided by manually-operated roof vents. Given this, William Koffel's assertion that these two systems provide an e-quivalent level of fire fighter safety is obviously in error.

The public comment submitted by the ICC Code Technology Committee (CTC) will address other modifications approved to code change proposal F144-09/10. The public comment submitted by the CTC will provide the rationale and justification for providing 30 minute finish rating protection for the wiring for the mechanical smoke removal system and for not including a requirement for standby power. Hence, this comment will not address these issues.

The modifications to code change F144-09/10 approved by the code changes committee do not improve the original proposal and, in my opinion, the committee's decision to allow the use of roof vents was based upon hearing the misinformation included in William Koffel's testimony in the code development hearing. Given this, it is requested that code change proposal F144 be approved "as submitted".

The probability that code change F144 being approved as "as submitted" is essentially nil. Given this, I would like to urge that the membership give consideration to the "as further modified" proposal submitted by the ICC Code Technology Committee. While I find any provisions which permits manually-activated roof vents to be provided, and to be considered to be equivalent to the manually-activated mechanical smoke removal system proposed, to be objectionable, the CTC's "as further amended" proposal is at least a first step in recognizing that roof vents do not perform as claimed by the vent manufacturers and their highly-paid consultants/lobbyists.

If the manufacturers of roof vents want to claim that their product does indeed "work" in buildings protected by a sprinkler system, then the further testing and research that was promised by the manufacturers 11-1/2 years ago should be conducted. The membership should not continue to "fall prey" to promises of imminent testing and research made time and again by a trade association with a long history of making false commitments to conducting further testing and research. It is time for the ICC membership to demand to see the research and testing from the vent manufacturers' trade association that conclusively demonstrates that roof vents will make "cold and wet smoke" defy the laws of physics and actually rise.

For more than 30 years now, the vent manufacturers have claimed that roof vents cause "cold and wet smoke" to defy the laws of physics and many in the fire service have fallen for this ruse. The "**laws of physics**" are referred to as laws because they have been proven over and over again to be true. The vent manufacturers cannot point to a single test or study that demonstrates that their product causes "cold and wet smoke" to rise. Why do so many in the fire service continue to believe the manufacturers claims without any evidence?

A vote for "as submitted" will force the manufacturers of vents to either do the testing and research to prove their claims or to stop making unsubstantiated claims. A vote for "as further modified" as proposed by the CTC will also do the same, but in a less forceful manner. Adopting this public comment or the CTC's public comment is far more preferable than the present code provisions or the original CTC proposal as modified by the code changes committee.

Notes: Excerpt from AAMA Smoke Vent Task Group (SVTG) Teleconference Minutes-March 24, 2009:

"*. . . .The concern remains that if C. Beyler is not willing to support the $100K SVTG Modeling Study, then the study is* ***worthless****. The members questioned why no other groups, organizations, or Fire Protection Engineers have come forward to defend the FDS program, particularly, Kevin McGratten* [McGrattan]*, from NIST, who wrote the original version of FDS, and has been intimately involved in it since its development. B.Sampson will contact K. McGratten* [McGrattan] *to obtain his thoughts on this.*"

Public Comment 2:

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

Further modify the proposal as follows:

910.2.1 (IBC [F] 910.2.1) Group F-1 or S-1 -A mechanical smoke removal system shall be installed in buildings or portions thereof used as a Group F-1 or S-1 occupancy exceeding 50,000 square feet in undivided area.

[F] 910.4. Mechanical smoke removal system. Where required by Sections 910.2.1 and 910.2.3, a mechanical smoke removal system shall be provided in accordance with this section.

Exceptions:

1. Buildings or portions thereof which are protected by ESFR sprinklers.
2. Buildings equipped with smoke and heat vents ~~designed in accordance with NFPA 204, when permitted by NFPA 13.~~ where approved by the code official. Where installed in buildings provided with an approved automatic sprinkler system, the operation of smoke and heat vents shall be in accordance with NFPA 13.

910.4.6 (IBC [F] 910.4.6) Wiring and control. Wiring for the operation and control of smoke removal system fans shall be connected ahead of the main disconnect installed in an approved location. ~~provided with power in accordance with Section 909.11~~ and be protected by materials with a finish rating of 30 minutes ~~not less than 1 hour~~.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The CTC studied available information and conducted numerous public meetings on this subject through a study group representing various interests, including building officials, fire officials, manufacturers, architects, engineers and consultants. The intent of the original proposal was to provide reasonable smoke removal provisions for post-fire fighting considerations. The IFC committee, via the modifications that were approved in Baltimore, has taken the original proposal in a direction for which the CTC is in significant disagreement. In effect, the modification took the proposal in a direction not intended by the original code change. This was evidenced by testimony at the hearings themselves where the CTC representative spoke against the modifications. Further, upon confusion of the committee action for "As Modified"; the CTC representative made a floor motion for "As Submitted" as the modified change is not consistent with the intent of the original proposal. The following is a discussion of the modifications approved by the IFC committee and how this public comment intends to direct the code change more closely back to the original intent.

Section 910.2.1:
IFC Modification: The IFC committee modification extends the application of the present smoke venting requirements from being limited to one-story buildings to buildings of any story height.

CTC's evaluation of the IFC modification:

The modification lacks technical substantiation;
This is a post fire fighting operation, not involving life safety;

CTC Public comment: As a post fire fighting system, CTC has not proposed to revise the requirements back to one story buildings. If the system is necessary and works for a single story, it will work for buildings having multiple stories. The public comment proposes to clarify that the 50,000 square feet area is a contiguous area and not the entire area of the building.

Section 910.4:
IFC Modification: The IFC committee modification allows the continued use of smoke and heat vents in sprinklered buildings.

CTC evaluation of the IFC modification:

After studying this issue for 2-1/2 years, the CTC concluded that there is no technical basis for vents in sprinklered buildings and proposed to remove the requirement;
Mechanical systems should be required for sprinklered buildings because any smoke removal must deal with cool smoke; reference is made to NFPA 204 for unsprinklered buildings only;
A review of the rationale included in the recent change to NFPA 13 includes recognition by the NFPA 13 technical committee that vents are mandated by other regulations, e.g., the IBC, and the standard actually includes precautionary measures for the use of vents in sprinklered buildings;
NFPA 204 -2010; CTC's original code change proposed a reference to the 2010 edition of NFPA 2010 which is not yet complete:

- The draft of NFPA 204 – 2010 does not provide design criteria for vents in a sprinklered building; the draft of NFPA 204 includes vague guidance formerly included in the Annex of the standard;
- The draft of NFPA 204 - 2010 does not include a design goal for the system (unlike the the criteria for mechanical systems), nor one which can be evaluated by an AHJ.

NFPA 204 – 2007: The modification by the IFC committee changed the referenced edition of NFPA 204 to the 2007 edition because this edition was complete and the 2010 edition (which may not be published until 2011) will not be available by the May/2010 Final Action Hearings:

- The 2007 edition of the standard includes only an Annex which is not part of the standard for smoke and heat vent design.

CTC public comment: Due to a lack of comprehensive design criteria in the 2007 edition of NFPA 204, the decision to allow smoke and heat vents needs to rest with the code official in terms of an assessment of the building in question. The added text to Exception 2 is taken from current section 910.3.2 which stipulates that the vents must be operational in accordance with NFPA 13.

Section 910.4.6:
IFC Modification: The IFC committee modification requires standby-power and one-hour rated electrical service to the ventilation equipment.

CTC evaluation of the IFC modification:

The mechanical smoke venting system is not an emergency system for "defend-in-place" strategy;
Smoke venting is a post fire fighting operation, not involving life safety of occupants or fire fighters;
It is unlikely there would be a need to intentionally cut power during fire fighting operations in a sprinklered building;
Other systems that are considered critical are not required to have standby power: the fire pump for the sprinklers, and general lighting needed for fire fighting operations;
Supporting one-hour power conductors by an unrated building structure presents a conflict with general fire protection philosophy.

CTC public comment: The mechanical smoke exhaust system is not an emergency smoke control system. A smoke control system is an active system designed to be used during fire conditions. The smoke exhaust system proposed by CTC is intended to be a post-fire system for use by the fire-service. As such, it need not be provided with emergency power. The finish rating originally proposed for 30 minutes is adequate since we are dealing with fully sprinklered buildings and is reasonably accomplished in buildings of all construction types. As a rule of thumb, membranes of one hour fire resistance rated assemblies will provide a 30 minute finish rating. CTC believes that this provides a reasonable level of protection for the circuits and that it should be acceptable to route the conductors within the cavities of one hour assemblies.

This public comment retains the committee modification to reference the 2007 edition of NFPA 204 as the standard is published because the 2010 edition will not be available by the 2010 May Final Action Hearings.

Public Comment 3:

Gregory R. Keith, Professional heuristic Development, representing The Boeing Company, requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

910.2.1 (IBC [F] 910.2.1) Group F-1 or S-1. A mechanical smoke removal system shall be installed in buildings or portions thereof used as a Group F-1 or S-1 occupancy exceeding 50,000 square feet.

Exception: Group S-1 aircraft repair hangars.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The purpose of Item F144-09/10 was to update the provisions that mandate roof vents in industrial and storage buildings. The code change requires that a manually-operated mechanical smoke removal system be provided for large industrial and storage buildings protected by a sprinkler system in lieu of the requirements for roof vents and draft curtains. Formerly, smoke and heat vents were not required in Group S-1 aircraft repair hangars due to an exception to Section 910.2.1. This exception was based on the fact that aircraft hangars are designed in accordance with the provisions of NFPA 409. IBC or IFC fire protection features should not be overlaid on that comprehensive standard.

This public comment for approval as modified reinstates the status quo for aircraft repair hangars. Inasmuch as aircraft repair hangars were exempt from smoke and heat vent requirements, it stands to reason that they should also be exempt from the provisions that replaced them. As was previously the case, NFPA 409 provisions should be allowed to stand on their own merit for these highly specialized buildings. The absence of loss history would indicate that current provisions are very adequate and additional fire protection features are not necessary and are unjustified.

Public Comment 4:

Tracey D. Bellamy, Telgian Corporation, representing self, requests Disapproval.

Commenter's Reason: The provisions of the proposal contain substantial design criteria changes that have not been supported by any technical data. The proposed criteria for design of mechanical exhaust systems using 4 air changes per hour is indicated in the original substantiation as being a reasonable value; however, no technical support is provided other than an indication that it is an average value between 2 and 6 air changes per hour. This change is premature at this time as efforts to develop a consensus design criteria for mechanical exhaust systems in a sprinklered building has not been completed. The far reaching impact of such criteria without sound technical justification is not acceptable.

Final Action: AS AM AMPC____ D

F146-09/10

910.5 (New) [IBC ([F] 910.5 (New)], Chapter 47

Proposed Changes as Submitted

Proponent: Justin H. Beal, representing the City of Fresno, CA, Fire Department

1. Add new text as follows:

910.5 (IBC [F] 910.5) Maintenance. Smoke and heat vents and mechanical smoke exhaust systems shall be maintained in an operative condition in accordance with NFPA 204. Fusible links shall be promptly replaced whenever fused, damaged or painted. Smoke and heat vents and mechanical smoke exhaust systems shall not be modified.

2. Add new standard to Chapter 47 as follows:

NFPA
204-2007 Standard for Smoke and Heat Venting

Reason: The maintenance of heat and smoke vents and mechanical smoke exhaust systems is not clearly addressed within the model International Fire Code. Installation and design criteria for smoke and heat vents can be found in I.F.C. section 910.3.1 (U.L. 793), however, maintenance provisions for these systems should be included within section 910 to provide clarity for the end user of the code. This proposal incorporates National Fire Protection Association Standard 204, Standard for Smoke and Heat Venting, 2007 edition, as the referenced standard for the maintenance of smoke and heat vents and mechanical smoke exhaust systems.

Routine inspection, testing and maintenance of these devices is essential for several reasons: These devices are typically only found in the largest commercial structures, and within these structures, the amount of fire loading is usually very high, to include high piled combustible storage.

Ensuring that these devices are inspected, tested and maintained in proper working order by the building owner (as specified in the new referenced standard) will have several positive effects for firefighter safety. These benefits include: easy identification of the location of the fire within the structure, the release of excess heat within the structure decreasing fire severity, increased visibility for firefighters within the structure, and the reduction of toxic products of combustion within the structure.

Additionally, the maintenance of these devices will have a mitigating effect on damage to the structure and/or its contents should a fire occur. These include: decreased likelihood of structural failure from heat retained within the structure and reduced damage to the structure and stored materials from smoke.

Finally, these devices are considered “fire protection systems” as noted in the I.F.C. section 902.1, and as such, a provision requiring specified inspection, testing and maintenance intervals via a referenced standard should be included within the body of the code.

The language of this section has been developed to follow (and is substantially similar to, and consistent with) the format found within the International Fire Code, Section 703.2.

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

Analysis: Review of proposed new standard NFPA 204-2007 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

ICCFILENAME: BEAL-F1-910.5.DOC

Public Hearing Results

Note: The following analysis was not in the Code Change monograph but was published on the ICC website at http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf

Analysis: Review of proposed new standard NFPA 204-2007 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria. Note that section 3.6.3.1 of CP28-05 requires that the standard be completed and readily available prior to Final Action Consideration. The final action of this proposal will occur May 14-23, 2010.

Committee Action: **Approved as Modified**

Modify proposal as follows:

NFPA

204-~~2007~~2010 Standard for Smoke and Heat Venting

(Portions of the proposal not shown remain unchanged.)

Committee Reason: The committee approved the proposal as it provides the necessary maintenance requirement for smoke and heat vents that the code currently lacks. The modification simply revises the standard edition of NFPA 204 to the 2010 edition.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Justin Beal representing the City of Fresno, CA, Fire Department and Marcelo M. Hirschler, GBH International, request Approval as Modified by this Public Comment.

Further modify the proposal as follows:

NFPA

204-~~2010~~ 2007 Standard for Smoke and Heat Venting

(Portions of the proposal not shown remain unchanged.)

Commenter's Reason (Beal): I am the original proponent of this code change proposal. During the code development hearings held in October 2009, a floor modification to this proposal was made and approved by the committee. The modification to the proposal consisted of changing the referenced standard to the 2010 edition of National Fire Protection Association Standard 204 – Standard for Smoke and Heat Venting (NFPA 204), from the 2007 edition of the same document. At the time of the code development hearings, it was generally thought that the 2010 edition of the standard would be readily available before the final action hearings, as those hearings had tentatively been scheduled for October 2010. Based upon the facts known at the time, this modification was acceptable.

However, as the final action hearing schedule has been revised, it has become apparent that the 2010 edition of NFPA 204 will not be readily available before the final action hearings as required by I.C.C. policy.

To ensure this proposal is included in the upcoming edition of the International Fire Code, it must be modified back to its original configuration to specify the 2007 edition of NFPA 204 as the referenced standard for the code section.

Commenter's Reason (Hirschler): The public comment simply revises the edition of the standard to 2007 as the 2010 edition will not be available prior to the final action hearings in Dallas. The ICC Code Development Policy Section 3.6.3.1 of CP28-05 requires that the standard be completed and readily available prior to Final Action Consideration.

Final Action: AS AM AMPC____ D

F147-09/10
912.4 (IBC [F] 912.4)

Proposed Change as Submitted

Proponent: Joshua D. Smith, New York State Department of State, Office of Fire Prevention and Control

Revise as follows:

912.4 ~~Signs~~ Markings. A metal sign with raised letters at least 1 inch (25 mm) in size shall be mounted on all fire department connections ~~serving automatic sprinklers, standpipes or fire pump connections~~ to indicate their function. The caps of fire department connections shall also be color-coded to indicate their function. ~~Such signs shall read: AUTOMATIC SPRINKLERS or STANDPIPES or TEST CONNECTION or a combination thereof as applicable.~~ Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served. The signs and the caps shall be marked as follows:

1. For a connection serving only a standpipe the sign shall read STANDPIPE and the cap shall be colored red.
2. For a connection serving a combination automatic sprinkler and standpipe system the sign shall read COMBINATION STANDPIPE AND SPRINKLER and the cap shall be colored yellow. If the automatic sprinkler system only covers a portion of the building the sign shall also indicate where the protected areas are located in the building.
3. For a connection serving an automatic sprinkler system only the sign shall read SPRINKLER or AUTOMATIC SPRINKLER and the cap shall be colored green. If the automatic system only covers a portion of the building the sign shall also indicate where the protected areas are located in the building.
4. For a connection serving a systems other than an automatic sprinkler system the sign shall read NON-AUTOMATIC SPRINKLER and the cap shall be colored silver.
5. Test connections shall have signs that read TEST CONNECTION and the caps shall be colored black.

Reason: There are often signs installed for fire department connections that are often a single color, such as chrome or brass signs, that are not easily read from the point where a fire apparatus will be able to first see the connection. The color coding of the caps will make identifying the function of the fire department connection more easily discernable from a greater distance for fire apparatus fire fighters.

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

ICCFILENAME: SMITHJ-F1-912.4.DOC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved the proposal as there are already so many labels involved with the building and often times the caps on fire department connections go missing. Additionally, colors often cannot be seen at night. Other comments addressed the fact that the methodology of labeling may vary from jurisdiction to jurisdiction.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Joshua D. Smith, New York State Dept. of State – Office of Fire Prevention and Control, requests Approval as Submitted.

Commenter's Reason: The committee stated several reasons for disapproving this proposal to which I would like to answer.

The first comment being that there are already many marking systems in place. The 2009 fire coder does make mandatory the use if signs to indicate the type of system being fed by the fire department connection as well as an additional sign for indicating areas that are protected when a system does not provide full building protection. In my experience in fire fighting and inspections it is often these signs are all one color, often the signs are chrome or brass to match the connections. Unless the responder is at the connection it is often difficult to determine what the FDC is feeding. The color coding provides an often faster means of determining what the FDC feeds.

The committee further stated that FDC caps often go missing. NFPA 25 states that the FDC plugs or caps are to remain in place and be undamaged. Even if a cap does go missing as part of keeping the system compliant the missing caps have to be replaced.

The committee also stated that colors cannot be seen at night. Neither can the signs that are already required. The only way to solve this would be to require the area the FDC is located be lighted on a continuous basis whether or not the caps are colored.

The committee further stated that coding systems may vary from jurisdiction to jurisdiction. The more common use of mutual aid agreements between jurisdictions, and the push to standardize equipment and terminology for NIMS compliance would be of benefit from a standardized color coding system. With this in mind, no matter where a fire department or personnel may be from when they have to respond to a call when covering another jurisdiction's response area the markings of a FDC will all mean the same and the mutual aid departments can still operate efficiently.

Final Action: AS AM AMPC____ D

F152-09/10

1206.2, 1206.2.1 (New), 1206.3, 1206.4

Proposed Change as Submitted

Proponent: David W. Dawson, R. R. Street & Co. Inc.

1. Revise as follows:

1206.2 ~~Type~~ Class I solvents. The maximum quantity of ~~Type I~~ Class I solvents permitted at any work station shall be 1 gallon (4 L). ~~Class I solvents shall be stored in approved safety cans or in sealed DOTn-approved metal shipping containers of not more than 1-gallon (4 L) capacity. Dispensing shall be from approved safety cans.~~ Spotting or pre-spotting shall be permitted to be conducted with Class I solvents where they are stored in and dispensed from approved safety cans or in sealed DOT-approved shipping containers of not more than 1 gallon (4 L) capacity.

2. Add new text as follows:

1206.2.1 Spotting and pre-spotting. Spotting and pre-spotting shall be permitted to be conducted with Class I solvents where dispensed from plastic containers of not more than 1 pint (0.5 L) capacity.

3. Revise as follows:

1206.3 ~~Type~~ Class II and III solvents. Scouring, brushing, and spotting and pretreating shall be permitted to be conducted with Class II or III solvents. The maximum quantity of ~~Type~~ Class II or III solvents permitted at any work

station shall be 1 gallon (4 L). In other than Group H-2 occupancy, the aggregate quantities of solvents shall not exceed the maximum allowable quantity per control area for use-open system.

1206.4 Type IV systems. Flammable and combustible liquids used for spotting operations shall be stored in approved safety cans or in sealed DOT~~n~~-approved ~~metal~~ shipping containers of not more than 1 gallon (4 L) in capacity. ~~Dispensing shall be from approved safety cans.~~ Aggregate amounts shall not exceed 10 gallons (38 L).

Reason: The purpose of the change is to revise outdated material. The proposed wording is intended to recognize the wide use of DOT-approved plastic containers to ship and store chemicals used in dry cleaning plants, including spotting chemicals. Use of these containers is permitted by OSHA for the storage of flammable and combustible liquids under conditions described in OSHA Directive STD 01-05-014. Equivalent changes have been made to NFPA 32.

Bibliography: 29 CFR 1910.106 Flammable and combustible liquids; OSHA Directive STD-01-05-014; NFPA 32.

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

ICCFILENAME: DAWSON-F2-1206.2.DOC

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with and approved the proposal based on the proponent's reason statement. The revised requirements will be less restrictive that those required by the OSHA directive listed in the bibliography, which requires fire detection at such work stations.

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

Modify the proposal as follows:

1206.2 Class I solvents. The maximum quantity of Class I solvents permitted at any work station shall be 1 gallon (4 L). Spotting or pre-spotting shall be permitted to be conducted with Class I solvents where they are stored in and dispensed from approved safety cans or in sealed DOT-approved <u>metal</u> shipping containers of not more than 1 gallon (4 L) capacity.

(Portions of the proposal not shown remain unchanged.)

Commenter's Reason: NFPA 32 clearly requires approved safety cans or DOT-approved metal shipping containers of not more than 1-gallon capacity for spotting or pre-spotting of Class I solvents.

NFPA 32-2007: 5.1.2 Spotting or prespotting shall be permitted to be conducted with Class I solvents if they are stored in and applied from sealed DOT-approved metal shipping containers of not more than 3.8 L (1 gal) capacity or approved safety cans.

Final Action: AS AM AMPC____ D

F153-09/10
1208.2

Proposed Change as Submitted

Proponent: David W. Dawson, R. R. Street & Co. Inc., representing Textile Care Allied Trades Association (TCATA) and Drycleaning and Laundry Institute (DLI).

Revise as follows:

1208.2 Automatic sprinkler system. An automatic sprinkler system shall be installed in accordance with Section 903.3.1.1 throughout dry cleaning plants containing Type II, Type III-A or Type III-B dry cleaning systems.

Exceptions:

1. An automatic sprinkler system shall not be required in Type III-A dry cleaning plants where the aggregate quantity of Class III-A solvent in dry cleaning machines and storage does not exceed 330 gal (1250 L) and dry cleaning machines are equipped with a feature that will accomplish any one of the following:
   1.1. Prevent oxygen concentrations from reaching 8 percent or more by volume.
   1.2. Keep the temperature of the solvent at least 30ºF (16.7ºC) below the flash point.
   1.3. Maintain the solvent vapor concentration at a level lower than 25 percent of the lower explosive limit (LEL).
   1.4. Utilize equipment approved for use in Class I, Division 2 hazardous locations in accordance with NFPA 70.
   1.5. Utilize an integrated automatic fire-extinguishing system complying with Section 4.6 of NFPA 32.
2. An automatic sprinkler system shall not be required in Type III-B dry cleaning plants where the aggregate quantity of Class III-B solvent in dry cleaning machines and storage does not exceed 3300 gal (12,490 L).

Reason: The purpose of this proposed code change is to eliminate the overly restrictive requirements for automatic sprinkler systems in dry cleaning facilities using modern dry cleaning equipment. Modern Type IIIA dry cleaning machines have intrinsic safety features that prevent fires from starting within the dry cleaning machine. It is preferable to prevent fires from starting in the first place, rather than extinguishing ones that have already started. NFPA 32 already allows these safety features to be used in lieu of automatic sprinkler systems.

Bibliography: NFPA 32

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

Analysis: The action on this proposal should be consistent with the action on Code Change F154-09/10.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's reason statement and preferred this proposal over F154-09/10, which its proponent offered to withdraw in favor of this proposal. It was felt that new dry cleaning equipment addresses the safety hazards adequately. Also, stating the exceptions in the code text is preferable to requiring the inspector to carry the referenced standard into the field as code change F154-09/10 would do. It was also noted that California and several other states have banned perchlorethylene which requires that operators purchase new equipment and the committee felt that adding a sprinkler requirement on top of that capital expense would be a hardship.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment 1:

Abraham B. Cho requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

1208.2 Automatic sprinkler system. An automatic sprinkler system shall be installed in accordance with Section 903.3.1.1 throughout dry cleaning plants containing Type II, Type III-A or Type III-B dry cleaning systems.

Exceptions:

1. An automatic sprinkler system shall not be required in Type III-A dry cleaning plants where the aggregate quantity of Class III-A solvent in dry cleaning machines and storage does not exceed 330 gal (1250 L) and employing dry cleaning machines listed by an approved testing agency, provided it is equipped with a feature that will accomplish any one of ~~the following~~ items 1.1 through 1.5 and each of items 1.6 through 1.8 :
   1.1. Prevent oxygen concentrations from reaching 8 percent or more by volume.
   1.2. Keep the temperature of the solvent at least 30ºF (16.7ºC) below the flash point.
   1.3. Maintain the solvent vapor concentration at a level lower than 25 percent of the lower explosive limit (LEL).
   1.4. Features that limit solvent vapor concentration at or below 60 percent of the LEL where automatic instrumentation with safety interlocks is provided in accordance with NFPA 69,
   1.5. Utilize equipment approved for use in Class I, Division 2 hazardous locations in accordance with NFPA 70.
   1.6. Utilize an integrated automatic fire-extinguishing system complying with Section 4.6 of NFPA 32.
   1.7. Utilize two sprinklers overhead using a domestic water line that releases water directly onto the outside of the dry cleaning machine.

1.8. Utilize a computer controlled maintenance and record keeping system to perform periodical maintenance, that also controls the dry cleaning machine to shut down.

2. An automatic sprinkler system shall not be required in Type III-B dry cleaning plants where the aggregate quantity of Class III-B solvent in dry cleaning machines and storage does not exceed 3300 gal (12,490 L).

Commenter's Reason: The purpose of this proposed code change is to eliminate the overly restrictive requirements for automatic sprinkler systems in dry cleaning facilities using modern dry cleaning equipment. Modern Type IIIA dry cleaning machines have intrinsic safety features that prevent and respond to fires within and surrounding the dry cleaning machine. It is preferable to prevent fires from starting in the first place, rather than extinguishing ones that have already started. NFPA 32 2007 Edition already allows some of these safety features to be used in lieu of automatic sprinkler systems.

(1)This proposal is missing 1.4 of the exception paragraph from NFPA 2007 edition. (2)There are two kinds of fire protection systems. One kind is fire prevention system that has features 1.1 thru 1.5 and 1.8 . The other system is a fire responding system as stated above in 1.6 and 1.7.

In order to have fire protection from inside and outside of a dry cleaning machine, the dry cleaning machine must be equipped with 1.6, thru 1.8 and any one of the following between 1.1 thru 1.5.

Bibliography: NFPA 32 2007 Edition

Public Comment 2:

Joe Pierce (Chairman), Dallas Fire Department, representing Joint Fire Service Review Committee, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

1208.2 Automatic sprinkler system. An automatic sprinkler system shall be installed in accordance with Section 903.3.1.1 throughout dry cleaning plants containing Type II, Type III-A or Type III-B dry cleaning systems.

Exceptions:

1. An automatic sprinkler system shall not be required in Type III-A dry cleaning plants where the aggregate quantity of Class III-A solvent in dry cleaning machines and storage does not exceed 330 gal (1250 L) and dry cleaning machines are equipped with a feature that will accomplish any one of the following:
   1.1. Prevent oxygen concentrations from reaching 8 percent or more by volume.
   1.2. Keep the temperature of the solvent at least 30ºF (16.7ºC) below the flash point.
   1.3. Maintain the solvent vapor concentration at a level lower than 25 percent of the lower explosive limit (LEL).
   1.4. Utilize equipment approved for use in Class I, Division 2 hazardous locations in accordance with NFPA 70.
   1.5. Utilize an integrated dry chemical, clean agent or water mist automatic fire extinguishing system ~~complying with Section 4.6 of NFPA 32~~ designed in accordance with Chapter 9.
2. An automatic sprinkler system shall not be required in Type III-B dry cleaning plants where the aggregate quantity of Class III-B solvent in dry cleaning machines and storage does not exceed 3300 gal (12,490 L).

Commenter's Reason: This proposal was Approved as Submitted at the Code Development Hearing. The purpose of this Public Comment is to clarify the types of extinguishing systems which will provide compliance with Exception Item 1.5.

The original code change referenced NFPA 32 Section 4.6 in Item 1.5. Since the requirements in Item 1.5 are substituting a fixed extinguishing for the building sprinkler system, it is preferable to identify the acceptable types of fire extinguishing systems. The reference to NFPA is replaced with a list of the specific types of automatic fire extinguishing systems allowed by NFPA 32 Section 4.6.

This Public Comment specifies that the extinguishing system must be either a dry-chemical system, a clean agent system, or a water mist system in order to be substituted for the fire sprinkler system. Chapter 9 provides design and installation criteria and references the correct NFPA standard for each type of extinguishing system.

Final Action: AS AM AMPC____ D

F155-09/10
1501.1, 1501.2; IBC [F] 416

Proposed Change as Submitted

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

1. Revise IFC as follows:

1501.1 Scope. This chapter shall apply to locations or areas where any of the following activities are conducted:

1. The application of ~~flammable or combustible paint, varnish, lacquer, stain, fiberglass resins or other flammable or combustible liquid applied~~ flammable finishes to articles or materials by means of spray apparatus ~~in continuous or intermittent processes~~.

2. ~~Dip tank operations in which articles or materials are passed through contents of tanks, vats or containers of flammable or combustible liquids, including coating, finishing, treatment and similar processes.~~ The application of flammable finishes by dipping or immersing articles or materials into the contents of tanks, vats or containers of flammable or combustible liquids for coating, finishing, treatment or similar processes.
3. The application of flammable finishes by applying combustible powders to articles or materials utilizing ~~when applied by~~ powder spray guns, electrostatic powder spray guns, fluidized beds or electrostatic fluidized beds.
4. Floor surfacing or finishing operations using Class I or II liquids in areas exceeding 350 square feet (32.5 m^2).
5. The application of flammable finishes consisting of dual-component coatings or Class I or II liquids when applied by brush or roller in quantities exceeding 1 gallon (4 L).
6. ~~Spraying and dipping operations.~~

1502.1 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.

FLAMMABLE FINISHES. ~~Material coatings~~ Coatings to articles or materials in which the material being applied is a flammable liquid, combustible liquid, combustible powder, fiberglass resin or flammable or combustible gel coating.

2. Revise IBC as follows:

SECTION 416
SPRAY APPLICATION OF FLAMMABLE FINISHES

[F] 416.1 General. The provisions of this section shall apply to the construction, installation and use of buildings and structures, or parts thereof, for the spraying of flammable ~~paints, varnishes and lacquers~~ finishes ~~or other flammable materials or mixtures or compounds used for painting, varnishing, staining or similar purposes~~. Such construction and equipment shall comply with the International Fire Code.

[F] 416.2 Spray rooms. *(No change to current text.)*

[F] 416.2.1 Surfaces. *(No change to current text.)*

[F] 416.2.2 Ventilation. Mechanical ventilation and interlocks with the spraying operation shall be in accordance with the International Fire Code.

[F] 416.3 Spraying spaces. *(No change to current text.)*

[F] 416.3.1 Surfaces. *(No change to current text.)*
[F] 416.4 Spray booths. *(No change to current text.)*

[F] 416.5 Fire protection. An automatic fire-extinguishing system shall be provided in all spray~~, dip and immersing spaces and storage~~ rooms and shall be installed in accordance with Chapter 9.

Reason: Item 1 – IFC: The revisions in this section are intended to clarify the application of Chapter 15. There is no change in application of this Chapter or the requirements therein.

First, the Scope is revised using the defined term of "flammable finishes".
1. Item #1 covers spray operations
2. Item #2 covers dipping operations
3. Item #3 covers electrostatic and fluidized beds
4. Item #4 specifies the limitation of Class I or II liquids when conducting floor surfacing
5. Item #5 covers dual-component coatings
6. Item #6 is deleted since it is covered in Items #1 and #2.

Second, the definition of "flammable finishes" is revised to include the coatings that are already regulated in Chapter 15.

These revisions are essentially editorial changes that will add clarity in the application of Chapter 15.

Item 2 – IBC: This proposal is designed to correlate the requirements for spray operations found in the IBC and the IFC.

Section 416 is revised to specify spray application of materials. This is consistent with the wording in Section 416.1 which limits the application of these requirements to spray operations.

Section 416.1 is revised to provide consistency with the scope in IFC Section 1501.1. This revision will include all of the operations that would be regulated within a spray room or spray booth.

Section 416.2.2 is added to reference the IFC which contains requirements for ventilation velocities and for interlocking the ventilation system with the spraying apparatus.

Section 416.5 is revised to be consistent with IFC Section 1505.4. A fire extinguishing system is not required for all dipping operations. For example, when using dip tanks of less than 150 gallons, a fire extinguishing system is an optional method of protection.

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

ICCFILENAME: LARIVIERE-F17-1501.1-G2-IBC416.DOC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee had concerns about combustible finishes being deleted and disagreed with the blanket removal of dipping operations from IBC Section 416.5 since the IFC does require fire protection for some dipping operations.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment 1:

Joe Pierce (Chairman), Dallas Fire Department, representing Joint Fire Service Review Committee, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

1501.1 Scope. This chapter shall apply to locations or areas where any of the following activities are conducted:

1. The application of *flammable finishes* to articles or materials by means of spray apparatus.
2. The application of a *flammable finishes* by dipping or immersing articles or materials into the contents of tanks, vats or containers of flammable or combustible liquids for coating, finishing, treatment or similar processes.
3. The application of *flammable finishes* by applying combustible powders to articles or materials utilizing powder spray guns, electrostatic powder spray guns, fluidized beds or electrostatic fluidized beds.
4. Floor surfacing or finishing operations using Class I or II liquids in areas exceeding 350 square feet (32.5 m^2).
5. The application of *flammable finishes* consisting of <u>organic peroxides,</u> dual-component coatings or Class I or II liquids when applied by brush or roller in quantities exceeding 1 gallon (4 L).

1502.1 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.

(Portions of the proposal not shown, remain unchanged.)

FLAMMABLE FINISHES. Coatings to articles or materials in which the material being applied is a flammable liquid, combustible liquid, combustible powder, fiberglass resin, <u>organic peroxide,</u> or flammable or combustible gel coating.

Commenter's Reason: This proposal was Disapproved at the Code Change Hearing because it needed clarification in the proposed text for both the IFC and IBC. The original item has been split into two Public Comments; one addressing the IBC and the other addresses the IFC. This Public Comment is intended to only address the revisions to the IFC. The revisions in this section are intended to clarify the application of IFC Chapter 15. There is no change in the requirements of this Chapter or the requirements therein.

The Scope has been revised by replacing the defined term of "flammable finishes" for the laundry list of processes the can be considered application of flammable finishes. This simple reference to flammable finishes, rather than the list, reduces the chance of leaving out a possible operation that should be regulated by this Chapter but not included in the list.

The arrangement of processes in 1501.1 is as follows:
Item 1 – spraying operations
Item 2 – dipping operations
Item 3 – electrostatic and fluidized beds
Item 4 – floor surfacing and floor refinishing
Item 5 – dual-component coatings and organic peroxides

Organic peroxides has been added to Item 5. Use of organic peroxides is already regulated in Section 1508 and now it will included in the scope of the Chapter.

Also, the definition of "flammable finishes" is revised to include the organic peroxide materials which are used as a flammable finish and are regulated in Chapter 15 as a flammable finish.

Public Comment 2:

Joe Pierce (Chairman), Dallas Fire Department, representing Joint Fire Service Review Committee, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

[F] SECTION 416 ~~SPRAY~~ APPLICATION OF FLAMMABLE FINISHES

416.1 General. The provisions of this section shall apply to the construction, installation and use of buildings and structures, or parts thereof, for the ~~spraying~~ application of flammable finishes. Such construction and equipment shall comply with the *International Fire Code*.

416.2 Spray rooms. *(No change to text)*

416.2.1 Surfaces. *(No change to text)*

416.2.2 Ventilation. Mechanical ventilation and interlocks with the spraying operation shall be in accordance with the *International ~~Fire~~ Mechanical Code*.

416.3 Spraying spaces. *(No change to text)*

416.3.1 Surfaces. *(No change to text)*

416.4 Spray booths. *(No change to text)*

416.5 Fire protection. An *automatic fire-extinguishing system* shall be provided in all spray, dip and immersing spaces and storage rooms and shall be installed in accordance with Chapter 9.

(Portions of the proposal not shown, remain unchanged.)

Commenter's Reason: This proposal was Disapproved at the Code Change Hearing because it needed clarification in the proposed text for both the IFC and IBC. The original item has been split into two Public Comments; one addressing the IBC and the other addresses the IFC. This Public Comment is intended to only address the revisions to the IBC. The revisions in this section are intended to clarify the application of IBC Section 416.

Section 416.1 is revised to cover the "application of flammable finishes" rather than just the spray operations of flammable finishes. Spray application is not the only method of applying flammable finishes. This revision will allow all of those other methods to be covered in this section.

Section 416.2.2 is revised to reference the IMC which contains requirements for ventilation velocities and for interlocking the ventilation system with the spraying apparatus.

Section 416.5 is revised by reverting back to the original text currently in the 2009 IBC. This wording includes dipping and immersing operations, and storage rooms where fire protection systems are required. Since the scope of Section 416 is revised to cover methods of application other than just spraying, it is appropriate to leave the reference to these other operations in this section.

Final Action: AS AM AMPC____ D

F156-09/10
1504.6.1.2.1

Proposed Change as Submitted

Proponent: Geoff Raifsnider, Global Finishing Solutions, representing self

Revise as follows:

1504.6.1.2.1 Interlocks. The spraying apparatus, drying apparatus and ventilating system for the spray booth or spray room shall be equipped with interlocks arranged to:

1. Prevent operation of the spraying apparatus while drying operations are in progress.
2. Prevent operation of the drying appratus until a timed purge of spray vapors from the spray booth or spray room is complete. This purge time shall be based upon introducing at least 4 standard cubic feet of fresh air per cubic foot of spray booth or spray room volume. ~~Purge spray vapors from the spray booth or spray room for a period of not less than 3 minutes before the drying apparatus is rendered operable.~~
3. Have the ventilating system maintain a safe atmosphere within the spray booth or spray room during the drying process and automatically shut off drying apparatus in the event of a failure of the ventilating system.
4. Shut off the drying apparatus automatically if the air temperature within the booth exceeds 200°F (93°C).

Reason: Although "not less than" implies that the value could be more, the current language does not state how the value is calculated. The proposed language clarifies how to calculate the purge time and bases it upon the amount of fresh air introduced. This proposal also eliminates the 3 minute minimum. There are applications where the delay in proceeding to curing can affect the quality of the product finish. In these applications the heating apparatus is often the same industrial heater that maintains the temperature during painting and the apparatus is outside the spray area and not subject to exposure to overspray. It should be acceptable to have a design where the purge time is a function of air flow.

Cost Impact: Any additional cost would be justified based upon the importance of the reduced purge time to achieve the quality of the product. This additional cost may be offset by the reduction in operating cost.

ICCFILENAME: RAIFSNIDER-F2-1504.6.1.2.1.DOC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee did not feel that it had adequate information to properly evaluate the proposal and that there was inadequate justification provided. It was unclear as to how the 4 scf per cubic foot of booth volume was determined. The current time-out interlock is straight forward and easy to inspect while the volume-based interlock would be difficult to inspect.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Geoff Raifsnider, Global Finishing Solutions, representing self, requests Approval as Submitted.

Commenter's Reason: Original proposal was rejected for lack of "adequate information to properly evaluate the proposal and that there was inadequate justification provided". The following comments are intended to serve as the additional information and justification requested during the code development hearings:

- A purge interval is a function of the spray booth size (cubic feet) and the ventilation rate (cubic feet per minute). Both of these values are documented and measurable for a given spray booth.
- The original proposal is based upon the language in NFPA 86 Standard for Ovens and Furnaces 2007 Edition. The idea is to replace the air in the booth at least four times (4 ft^3 of air/ft^3 of booth) to ensure that the concentration at the end of the purge interval is less than 25% of the lower flammable limit.
- To verify that the purge time is sufficient to meet the code, multiply the volume of the booth by four (4) and divide by the exhaust flow rate. An example would be a spray booth that measures 10 ft wide x 10 ft high x 14 ft long (volume = 1,400 ft3). If this booth was designed for 100 feet per minute downdraft the exhaust flow rate would be 14,000 ft3/min (10 ft x 14 ft x 100 fpm). To calculate the minimum purge time you would multiply 1400 ft3 by four (4) and divide by 14,000 ft3/min. The resulting minimum purge time would be 0.4 minutes (1400x4/14000=0.4).
- To address the comments that the proposed changes would be difficult to inspect. The IFC (1506.1.2) currently requires compliance with Chapter 21 when utilizing drying in a spray booth. Section 2107.2 states that a nameplate shall be provided that, among other information, indicates the required purge time (2107.2(3)). The code official can initially verify that the purge timer is set to this value. If there is cause to doubt this information the calculations mentioned can be performed to verify the minimum purge time.
- There are many paint finishing operations, typically in the automotive refinish industry, that are negatively affected by the delay between painting and curing at an elevated temperature. By allowing the proposed changes, the spray booth designer can take into account the importance the purge interval may have on the process. By designing for the correct air flow, both a safe environment for energizing the drying apparatus and a minimum time between spray and cure can be achieved.

Final Action: AS AM AMPC____ D

F157-09/10
1504.7.3

Proposed Change as Submitted

Proponent: Geoff Raifsnider, Global Finishing Solutions, representing self

Revise as follows:

1504.7.3 Air velocity. Ventilation systems shall be designed, installed and maintained to be capable of confining and removing overspray and vapors. The vapor concentration in the exhaust air stream shall be less than 25 percent of the lower flammable limit. ~~such that the average air velocity over the open face of the booth, or booth cross section in the direction of airflow during spraying operations, shall not be less than 100 feet per minute (0.51 m/s).~~

Reason: This proposal eliminates the 100 fpm minimum air velocity. The proposed language removes the specific value while still stating the required performance. There are many types of booths and rooms in which the 100 fpm value would be detrimental to the quality of the product and is well in excess of the minimum dilution air needed to keep the space and exhaust below 25% of the LFL. This extra air also increases the operating costs. The air velocities for a specific spray booth or spray room should be specific to the individual design that accomplishes the desired performance (ie. 25% LFL or containment of overspray at openings). Chapter 13.75 of Industrial Ventilation – A Manual of Recommended Practice 26th Edition Published by ACGIH, lists many air velocity ranges for various painting operations, some above and some below 100 fpm. This publication could be included in the standard as reference material.

Cost Impact: The code change proposal would decrease the construction and operating costs.

ICCFILENAME: RAIFSNIDER-F1-1504.7.3.DOC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee did not feel that it had adequate information to properly evaluate the proposal and that there was inadequate justification provided. The current stated air velocity is straight forward and easy to measure, whereas determining 25% of the LFL would require expensive equipment and it is unclear as to who would be responsible to provide such equipment.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Geoff Raifsnider, Global Finishing Solutions, representing self, requests Approval as Submitted.

Commenter's Reason: Original proposal was rejected for lack of "adequate information to properly evaluate the proposal and that there was inadequate justification provided". The following comments are intended to serve as the additional information and justification requested during the code development hearings:

Comments

- The original proposal is based upon language in NFPA 33 Standard for Spray Application Using Flammable or Combustible Materials 2007 Edition.
- The intent of the original proposal was to establish a performance requirement. The desired consequences of ventilation in an open spray booth are to confine the overspray to the booth and to ensure that the concentration level does not reach the flammability limit. To assign a fixed value to all spray booth configuration may not provide for a safe and efficient piece of equipment.
- Confinement by velocity is unnecessary in a totally enclosed spray booth.
- Concentration levels can be calculated based upon the material feed rate and quantity of the spray guns and the exhaust flow rate.
- It was not the intent of the proposal to add requirements for equipment to monitor the concentration of flammable vapors in the booth or booth exhaust. With regards to ventilating spray areas, rooms, and booths, NFPA 33 and the IFC already have similar language stating that the concentration of flammable materials in the exhaust system must be kept below 25 percent of the lower flammable limit (LFL). [1, 2]
- The minimum velocity in a paint spray booth could be calculated based upon the requirement to keep the exhaust below 25 of the LFL. However, there are additional performance requirements that may increase this value. NFPA 33 describes the objective of the ventilation system as being capable of confining and removing flammable and combustible materials without prescribing a minimum value of air flow or velocity.[1] It becomes the responsibility of the equipment manufacturer to adequately design the ventilation system to achieve the stated objective based upon conditions such as the type of enclosure and paint application devices.
- Chapter 13.75 of Industrial Ventilation – A Manual of Recommended Practice 26th Edition Published by ACGIH, lists many air velocity ranges for various painting operations, some above and some below 100 fpm. This publication could be included in the standard as reference material. Some examples from this reference are:
    - Large Paint Booth, Cross Draft, Walk-in, Airless Electrostatic or HVLP Spray = 60 cfm/sq ft
    - Open Face Booth, Over 4 sq ft, Airless Electrostatic or HVLP Spray = 100 cfm/sq ft
    - Vehicle Paint Booth, Cross Draft, W x H >150 sq ft = 50 cfm/sq ft

References

1 Chapter 7.2, NFPA 33, Standard for Spray Application Using Flammable or Combustible Materials 2007 Edition
"Each spray area shall be provided with mechanical ventilation that is capable of confining and removing vapors and mists to a safe location and is capable of confining and controlling combustible residues, dusts, and deposits. The concentration of the vapors and mists in the exhaust stream of the ventilation system shall not exceed 25 percent of the lower flammable limit."

2 Chapter 510.3, 2009 International Mechanical Code® 2009 Edition
"The design and operation of the exhaust system shall be such that flammable contaminants are diluted in noncontaminated air to maintain concentrations in the exhaust flow below 25 percent of the contaminant's lower flammability limit."

Final Action: AS AM AMPC____ D

F163-09/10
1803.16 (New), 1802.1, 3704.1.2, 3704.1.3

Proposed Change as Submitted

Proponent: Ron Fuhrhop, Praxair, Inc.

1. Add new text as follows:

1803.16 Sub-atmospheric Gas Systems (SAGS) Type 1 and Type 2. The storage and use of Sub-atmospheric Gas Systems (SAGS) shall be in accordance with Sections 1803.16.1 through 1803.16.1.3.
1803.16.1 General. Sub-atmospheric Gas Systems (SAGS) gas source packages shall meet all of the requirements for compressed gases and gases except as provided for in 1803.16.1.1 through 1803.16.1.3.

1803.16.1.1 Incompatible gases. Sub-atmospheric Gas Systems (SAGS) gas source packages with a water volume of 2.64 gallons (10 L) or less containing incompatible gases shall be permitted to occupy the same gas cabinet or exhausted enclosure.

1803.16.1.2 Ventilation. For Sub-atmospheric Gas Systems (SAGS), gas source packages, ventilation in gas cabinets and exhausted enclosures shall be sufficient to maintain vapors below 25 percent of LFL and below the IDLH concentration.

1803.16.1.3 Overpressure protection. The gas distribution system to which Sub-atmospheric Gas Systems (SAGS) are connected shall be equipped with an approved method of protection against components exceeding their pressure rating in the event of a failure in a SAGS.

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 SYSTEM (SAGS) Type 1. A gas source package that stores and delivers gas at sub-atmospheric pressure and 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 a package temperature of less than 110^{o} F.

SUB-ATMOSPHERIC GAS SYSTEM (SAGS) Type 2. A gas source package that stores compressed gas and delivers gas sub-atmospherically and includes a container (e.g., gas cylinder and outlet valve) that stores gas at a pressure greater than 14.7 psia and delivers gas at a pressure of less than 14.7 psia at a package temperature of less than 110^{o} F.

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.
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.

   Exception: Sub-atmospheric Gas Systems (SAGS) Type 1 and Type 2 shall be in accordance with Section 1803.16.1.2

3704.1.3 Exhausted enclosures. 3704.1.3 Exhausted enclosures. Exhausted enclosures containing highly toxic or toxic *compressed gases* shall comply with Section 2703.8.5 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).
2. Exhausted enclosures shall be connected to an exhaust 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.

   Exception: Sub-atmospheric Gas Systems (SAGS) Type 1 and Type 2 shall be in accordance with Section 1803.16.1.2.

Reason: This code change proposal adds definitions and requirements to address the technology of sub-atmospheric gas systems (SAGS), which are not currently found in the code. This new language is proposed for Chapter 18, since SAGS's are exclusively used in Semiconductor Fabs.

A primary goal of SAGS is to improve safety by reducing the risk of a gas release. The risk is reduced, because SAGS only deliver gas when a vacuum is applied to the cylinder connection. In a SAGS, the cylinder valve can be opened, but no gas is released until the pressure downstream of 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 SAGS successfully for ten years.

1802.1: The proposed definitions are similar to the definitions in the 2009 Edition of NFPA 318, Standard for the Protection of Semiconductor Fabrication Facilities. However, one change was made (110 ^{o} F is referenced instead of NTP). To meet the SAGS definition in NFPA 318, the pressure in a SAGS container must be sub-atmospheric at or below NTP, which is a temperature of 70 ^{o} F. SAGS used in semiconductor tools are located in exhausted enclosures with internal temperatures of 86^{o} F to 104^{o} F (above 70^{o} F). SAGS stored outside may reach temperatures of 110^{o} F (above 70^{o} F). So, to meet this proposed definition for SAGS, the container pressure should be sub-atmospheric at temperatures up to 110^{o} F. If NTP is used as a reference, some Type 1 SAGS could go "above" atmospheric pressure under these normal storage and use conditions.

1803.16.1: All SAGS shall meet the requirements for gases and compressed gases set forth throughout the IFC & IBC, with the specific exceptions allowed in the new SAGS section. Treating SAGS as compressed gases or gases maintains risk-mitigating controls that are well-established in safety and fire protection standards.

1803.16.1.1: This section will allow the placement of SAGS containers with incompatible gases in the same exhausted enclosure, such as containers of arsine and boron trifluoride. IFC Section 1804.3.3 requires the separation of these containers. This separation does not reflect current industry practice and is not necessary with the enhanced safety provided by SAGS. It should be noted, this exception is limited to small cylinders of 10 L of water volume or less. This limits the quantity of material and covers current semiconductor tool applications where SAGS are used.

1803.16.1.2: Ventilation is still required for SAGS. Potential releases from SAGS are very small. For this reason lower ventilation rates are acceptable. The performance standard (maintain vapors below 25 percent of LFL and below IDLH) was used instead of velocity or other prescribed values.

1803.16.1.3: Overpressure protection is standard practice for piping systems. Since SAGS delivery piping systems normally operate in a vacuum, this requirement was added to clarify that overpressure condition could result from potential failure scenarios. There are several methods used today to address this issue. It is also a performance based requirement.

3704.1.2 and 3704.1.3: These additions eliminate a conflict in Chapter 37 that would be created by adopting the new language of 1803.16.1.2. They refer the code user back to Chapter 18 to determine exhaust requirements for SAGS.

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

Analysis: The action on this proposal should be consistent with the action on Code Change F164-09/10.

ICCFILENAME: FUHRHOP -F1-1802.1.DOC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee preferred code change F164-09/10 over this proposal to avoid conflicting requirements with NFPA 318.

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 representing Praxair Inc, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

1803.16 Sub-atmospheric Gas Systems (SAGS) ~~Type 1 and Type 2~~. The storage and use of Sub-atmospheric Gas Systems (SAGS) shall be in accordance with Sections 1803.16.1 and 1803.16.1.1 ~~through 1803.16.1.3~~.

1803.16.1 General. Sub-atmospheric Gas Systems (SAGS) gas source packages shall meet all of the requirements for compressed gases and gases except as provided for in 1803.16.1.1 ~~through 1803.16.1.3~~.

~~**1803.16.1.1 Incompatible gases.** Sub-atmospheric Gas Systems (SAGS) gas source packages with a water volume of 2.64 gallons (10 L) or less containing incompatible gases shall be permitted to occupy the same gas cabinet or exhausted enclosure.~~

1803.16.1.2.1 Ventilation. For Sub-atmospheric Gas Systems (SAGS), gas source packages, ventilation in gas cabinets and exhausted enclosures shall be sufficient to maintain vapors below 25 percent of LFL and below the IDLH concentration.

~~**1803.16.1.3 Overpressure protection.** The gas distribution system to which Sub-atmospheric Gas Systems (SAGS) are connected shall be equipped with an approved method of protection against components exceeding their pressure rating in the event of a failure in a SAGS.~~

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 SYSTEM (SAGS) Sub-atmospheric Gas Storage and Delivery System. A system that includes a gas container (e.g., gas cylinder or authorized DOT gas receptacle) which under normal operation allows for gas flow from a container only when the container valve outlet is exposed to a pressure of less than one atmosphere pressure (760 Torr).

~~**SUB-ATMOSPHERIC GAS SYSTEM (SAGS) Type 1.** Sub-atmospheric Gas Storage and Delivery System. A gas source package that stores and delivers gas at sub-atmospheric pressure and 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 a package temperature of less than 110°F.~~

~~**SUB-ATMOSPHERIC GAS SYSTEM (SAGS) Type 2.** Sub-atmospheric Gas Delivery System. A gas source package that stores compressed gas and delivers gas sub-atmospherically and includes a container (e.g., gas cylinder and outlet valve) that stores gas at a pressure greater than 14.7 psia and delivers gas at a pressure of less than 14.7 psia at a package temperature of less than 110°F.~~

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: Sub-atmospheric Gas Systems (SAGS) shall be in accordance with Section 1803.16.1.1.

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.

   ~~**Exception:** Sub-atmospheric Gas Systems (SAGS) Type 1 and Type 2 shall be in accordance with Section 1803.16.1.2~~

3704.1.3 Exhausted enclosures. Exhausted enclosures containing highly toxic or toxic *compressed gases* shall comply with Section 2703.8.5 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: Sub-atmospheric Gas Systems (SAGS) shall be in accordance with Section 1803.16.1.1.

2. Exhausted enclosures shall be connected to an exhaust 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.

   ~~**Exception:** Sub-atmospheric Gas Systems (SAGS) Type 1 and Type 2 shall be in accordance with Section 1803.16.1.2.~~

Commenter's Reason: The following reason was prepared by William Winslow. Sub-atmospheric gas systems (SAGS) are used primarily in the semiconductor industry. As such, the issues regarding SAGS are not well understood by some fire protection officers (FPO). After a number of code development cycles where SAGS proposals were discussed and disapproved, the Fire Code Committee voted to wash its hands of the issue by disapproving Item 163 and adopting Item 164. Item 164 references NFPA 318, Standard for the Protection of Semiconductor Facilities, for the regulation of SAGS. Many jurisdictions and organizations routinely involved with the semiconductor industry and the use of SAGS, including the California Fire Chiefs Association (Cal Chiefs), don't agree with the Committee's action. Adoption of NFPA 318 eliminates safety controls required for the prudent use of toxic and highly toxic gases in SAGS containers, including automatic shutoff valves, gas treatment systems and incompatible gases in the same enclosure. On the other hand, approving Item 163, as modified by this public comment, will maintain all of the existing safety controls, with the exception of allowing a small reduction in exhaust ventilation. I have worked for and regulated the semiconductor industry for many years. I agree with the Cal Chiefs that the best course of action is to approve Item 163, as modified by this public comment, and disapprove Item 164. This will keep the technical safety issues regarding the use of SAGS in the hands of FPOs, where they belong. William Winslow CIH, CFI, CMI, previous member of the Fire Code Committee and past National Codes Director for the Washington State Association of Fire Marshals.

Cost Impact: The code change proposal may reduce the cost of construction and operation.

Final Action: AS AM AMPC____ D

F164-09/10
1803.16 (New), Chapter 47

Proposed Change as Submitted

Proponent: James McManus, ATMI, Inc.

1. **Add new text as follows:**

1803.16 Sub-atmospheric pressure gas systems. Sub-atmospheric pressure gas systems (SAGS) shall be in accordance with NFPA 318.

2. Add new standard to Chapter 47 as follows:

NFPA
318—09 Standard for the Protection of Semiconductor Fabrication Facilities

Reason: Sub-atmospheric pressure gas systems (SAGS) are the preferred method for storing and delivering the toxic and corrosive dopant gases used in ion implantation processes worldwide. Other uses include solar and electronics. SAGS operate by either removing pressure [Type 1] or internally controlling gas pressure [Type 2]. Both require a vacuum [sub-atmospheric condition, < 14.7 psia] before flow from a cylinder will occur. SAGS significantly reduce the risk associated with Hazardous Production Materials because they mitigate the likelihood and magnitude of a gas release and their use is becoming more common. As such, provisions regulating SAGS should be included in the code.

NFPA 318 already defines and addresses these systems so there is no reason to reinvent provisions for these systems. This proposal recommends that provisions for SAGS be adopted by reference as shown. It is the intent of this code change to adopt only the provisions relating to SAGS within NFPA 318. Those sections are: Section 3.3.28.5 for the definition, and Section 8.6.2 addressing uses and controls. It is not the intent of this proposal to adopt NFPA 318 in total. The charging statement of this proposal clearly indicates that only SAGS be in accordance with NFPA 318.

The definition and controls for use of SAGS are the work-product of a lengthy public debate and consensus building effort undertaken by knowledgeable ESH and risk management professionals. The NFPA 318 Technical Committee approved the language unanimously and it was adopted by a substantial majority at the NFPA annual meeting in June 2008.

Using the NFPA definition in section 3.3.28.5 incorporates language that most accurately defines SAGS and avoids possible conflicts that may be inadvertently introduced with alternative language.

Systems fitting this description include:
Sub-atmospheric Gas System. [Type 1/SAGS] A gas source container where the contents are at sub-atmospheric pressure [<14.7 psia] at NTP* [21ºC and 1 atmosphere]. Type 1/SAGS are not compressed gases.

Vacuum Initiated Gas Cylinder. [Type 2/SAGS] A compressed gas cylinder, modified internally using pressure and flow components to limit and control delivery pressure to sub-atmospheric pressure operation [<14.7 psia]. Today such systems are *designed to fail* in a closed [no-flow] position.

Section 8.6.2 contains requirements consistent with the risk reduction afforded by the SAGS technology. Local jurisdictions may, at their discretion, further modify the uses and controls based on existing ordinances or practice, or exceptions to the provisions could be added to this proposal.

Recognizing SAGS in the code helps officials and users ensure uniform application and understanding of this important risk reduction technology.

*NTP—see 2702.1

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

Analysis: A review of the standard(s) proposed for inclusion in the code, NFPA 318—09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009. The action on this proposal should be consistent with the action on Code Change F163-09/10.

ICCFILENAME: MCMANUS-F1-1803.16.DOC

Public Hearing Results

Note: The following analysis was not in the Code Change monograph but was published on the ICC website at http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf :

Analysis: Review of the proposed new standard NFPA 318-09 indicated that, in the opinion of ICC staff, the standard did comply with ICC standards criteria.

Committee Action: **Approved as Submitted**

Committee Reason: The committee preferred this proposal over F163-09/10 because it is more comprehensive in its approach to the subject matter by referencing a nationally recognized standard that SAGS facilities will be required (by insurers) to comply with anyway. Also, F163-09/10 would only regulate ventilation whereas NFPA 318 regulates the entire concept of SAGS.

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 representing Praxair Inc, requests Disapproval.

Commenter's Reason: Recommend disapproval of F164 and approval of Item 163, as modified by the public comment. See Reason statement in F163 comment.

Final Action: AS AM AMPC____ D

F166-09/10
1805.2.3.4

Proposed Change as Submitted

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing The Semiconductor Industry Association

Revise as follows:

1805.2.3.4 Pyrophoric liquids and Class 3 water-reactive liquids. Pyrophoric liquids and Class 3 water-reactive liquids in containers greater than 0.5-gallon (2 L) but not exceeding 5.3-gallon (20 L) capacity shall be allowed at workstations when located inside cabinets and the following conditions are met:

1. Maximum amount per cabinet: The maximum amount per cabinet shall be limited to 5.3 gallons (20L).
2. Cabinet construction: Cabinets shall be constructed in accordance with the following:
   2.1. Cabinets shall be constructed of not less than 0.097-inch (2.5 mm) (12 gage) steel.
   2.2. Cabinets shall be permitted to have self-closing limited access ports or noncombustible windows that provide access to equipment controls.
   2.3. Cabinets shall be provided with self- or manual-closing doors. Manual-closing doors shall be equipped with a door switch that will initiate local audible and visual alarms when the door is in the open position.
3. Cabinet exhaust ventilation system: An exhaust ventilation system shall be provided for cabinets and shall comply with the following:
   3.1. The system shall be designed to operate at a negative pressure in relation to the surrounding area.
   3.2. The system shall be equipped with ~~a pressure monitor and a flow switch alarm monitored~~ monitoring equipment to ensure exhaust flow and alarmed at the on-site *emergency control station*.
4. Cabinet spill containment: Spill containment shall be provided in each cabinet, with the spill containment capable of holding the contents of the aggregate amount of liquids in containers in each cabinet.
5. Valves: Valves in supply piping between the product containers in the cabinet and the workstation served by the containers shall fail in the closed position upon power failure, loss of exhaust ventilation and upon actuation of the fire control system.
6. Fire detection system: Each cabinet shall be equipped with an automatic fire detection system complying with the following conditions:
   6.1. Automatic detection system: UV/IR, highsensitivity smoke detection (HSSD) or other *approved d*etection systems shall be provided inside each cabinet.
   6.2. Automatic shutoff: Activation of the detection system shall automatically close the shutoff valves at the source on the liquid supply.
   6.3. Alarms and signals: Activation of the detection system shall initiate a local alarm within the *fabrication area* and transmit a signal to the *emergency control station*. The alarms and signals shall be both visual and audible.

Reason: Several commercially available bulk liquid pyrophoric cabinets are designed to meet the requirements of the IFC Chapter 18 section 1805.2.3.5 Pyrophoric Liquids and Class 3 water-reactive liquids. Typical pyrophoric cabinets are designed with nitrogen gas (N_2) fire protection systems to meet the requirements for pyrophoric liquids as outlined in Chapter 18 Table 1805.2.2 note d "Allowed only in workstations that are internally protected with an approved automatic fire-extinguishing or fire protection system complying with Chapter 9 and compatible with the reactivity of the materials in use at the workstation." In order for an N_2 fire suppression system to be effective it must displace the O_2 within the cabinet. In order to displace O_2 within the cabinet and still maintain at a negative exhaust pressure within the cabinet in relation to the surrounding

area, these cabinets must be airtight. Airtight indicates that these cabinets will operate under static only, when exhaust is applied, however, there will be no exhaust flow because there is no mechanism for make-up air into the cabinet. Design criteria are currently specified for liquid pyrophoric cabinets on site to meet O_2 levels below 1% within 60 seconds during discharge of the N_2 fire suppression system, which again requires these cabinets to be airtight. The current exhaust flow within these cabinets with the doors closed is effectively zero and to low for commercially available exhaust flow meters to detect. Cabinet exhaust is monitored with an exhaust pressure switch to detect available exhaust static. Some facilities currently monitor cabinet exhaust static within cabinets with a Neo-Dyn pressure switch (part#142P80CC3443) or a Dwyer (part#1910-1) and alarm for exhaust static below 1" w.c. The installation of a flow switch in addition to the pressure switch is redundant to the pressure switch. The installation of a flow switch is also ineffective due to the zero exhaust flow condition based on the cabinet design. Therefore requirements for exhaust flow monitoring are being changed to a performance requirement.

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

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's reason statement and felt that the proposal provides a needed update to current performance-based technology.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment 1:

Patrick A. McLaughlin, McLaughlin & Associates, representing The Semiconductor Industry Association, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

1805.2.3.4 Pyrophric liquids and Class 3 Water-reactive liquids. Pyrophoric liquids and …

1. through 2.3. (No change)
3. Cabinets exhaust ventilation system: An exhaust ventilation system shall be provided for cabinets and shall comply with the following:
   3.1. The system shall be designed to operate at a negative pressure in relation to the surrounding area.
   3.2. The system shall be equipped with monitoring equipment to ensure that required exhaust flow or static pressure is provided and that low flow or static pressure conditions send an alarm~~ed at~~ to the on-site emergency control station.
4. through 6.3. (No change)

Commenter's Reason: To clarify that exhaust static will be monitored if there is no exhaust flow. That was the intent of the original proposal. SIA was made aware of the potential confusion at the Code Development Hearings and committed to correct it.

Public Comment 2

Joe Pierce (Chairman), Dallas Fire Department representing Joint Fire Service Review Committee, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

1805.2.3.4 Pyrophoric liquids and Class 3 water-reactive liquids. Pyrophoric liquids and Class 3 water-reactive liquids in containers greater than 0.5-gallon (2 L) but not exceeding 5.3-gallon (20 L) capacity shall be allowed at workstations when located inside cabinets and the following conditions are met:

1. through 2.3. *(No change)*
3. Cabinet exhaust ventilation system: An exhaust ventilation system shall be provided for cabinets and shall comply with the following:
   3.1. The system shall be designed to operate at a negative pressure in relation to the surrounding area.
   3.2. The system shall be equipped with monitoring equipment to ensure that required exhaust flow or static pressure is provided. ~~and~~
   3.3. Low flow or static pressure conditions shall send an alarm~~ed at~~ to the on-site emergency control station. The alarm shall be both visual and audible.
4. through 6.3 (No change)

Commenter's Reason: This Public Comment revises Item 3 to clarify and separate the issues of monitoring and the resultant alarms associated with exhaust monitoring.

Item 3.2 is revised to clarify that exhaust static will be monitored when there is no exhaust flow. That was the intent of the original proposal and this proposal states it clearly.

Item 3.3 addresses the action when there is low flow or failure of the exhaust system. The requirement that the alarm must be audible and visual is also included. Currently, Item 6.3 requires an audible and visual alarm for the fire detection system. The failure of the exhaust ventilation system on a cabinet containing pyrophoric materials deserves the same level of notification. Therefore, the language from Item 6.3 is duplicated in Item 3.3 to require audible and visual alarms when the exhaust ventilation system fails.

Final Action: AS AM AMPC____ D

F173-09/10

2206.8.1, 2206.8.2 (New), 2202.1

Proposed Change as Submitted

Proponent: Ken Boyce, Underwriters Laboratories, representing Doug Horne, Clean Vehicle Education Foundation; Wendy Clark, National renewable Energy Laboratory

1. Revise as follows:

2206.8.1 Approval of equipment. Dispensers, hoses, nozzles, breakaway fittings, swivels, flexible connectors or dispenser emergency shutoff valves, vapor recovery systems, leak detection devices and pumps used in alcohol blended fuel-dispensing systems shall be listed or approved for the specific purpose.

2. Add new text as follows:

2206.8.2 Material compatibility. Tanks and fluid handling components that contact alcohol blended fuels shall be fabricated from corrosion resistant materials that mitigate galvanic action and resist corrosion from internal and external sources. Dissimilar metallic parts that promote galvanic action shall not be joined.

(Renumber subsequent sections)

3. Revise definition as follows:

2202.1 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.

ALCOHOL BLENDED FUELS. Alcohol blended fuels, including those containing nominally 85-percent ethanol 15-percent unleaded gasoline (E85), are flammable liquids consisting of ethanol or other alcohols blended greater than ~~15~~10-percent by volume.

Reason: This proposal updates E85 and other alcohol blended fuel dispensing requirements. Specifically, the proposal:

1. Revises the definition of alcohol blended fuels that was introduced into the 2006 IFC. The proposed revision clarifies that these are fuels containing between 10 and 85% ethanol by volume. Presently, gasoline blends containing up to 10% ethanol (also known as “gasohol”) are permitted to be dispensed into conventional (non-flex fuel) vehicles, although there the possibility in the near-term that blends containing more that 10% ethanol may be permitted for conventional vehicles. Clarifying the limit from 15 to 10% is necessary and will help the IFC address potential near-term deployment of fuels with more ethanol.
2, Adds leak detection devices to the types of equipment specifically requiring approval for use with alcohol blended fuels. Practical experience has shown that leak detection equipment needs to be compatible for use with alcohol blended fuels or it may not be able to perform its intended function.
3. Adds a new section 2606.8.2 with requirements covering the compatibility of the fuel containment systems materials with the alcohol blended fuels. The wording for this section is similar to wording currently in Section 3403.6.5, which addresses external corrosion, not internal corrosion. Alcohols are polar compounds that exhibit increased moisture absorption, water solubility, polar solvency and solution conductivity relative to gasoline, and can cause increased corrosion.

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

ICCFILENAME: BOYCE-F1-2206.8.1.DOC

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's reason statement and felt that the code change better accommodates alcohol-blended fuels.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment 1:

Richard S Kraus representing American Petroleum Institute (API) and Jeffrey Shapiro, International Code Consultants representing Steel Tank Institute, request Approval as Modified by this Public Comment.

Modify the proposal as follows:

~~2206.8.2 Material compatibility.~~ ~~Tanks and fluid handling components that contact alcohol blended fuels shall be fabricated from corrosion resistant materials that mitigate galvanic action and resist corrosion from internal and external sources. Dissimilar metallic parts that promote galvanic action shall not be joined.~~

(Portions of the proposal not shown remain unchanged.)

Commenter's Reason (KRAUS): This comment is to delete a new added section 2606.8.2. The proposed requirements would severely restrict the use if existing tanks and piping. There have been no reported serious problems due to the supposedly incompatibility of the fuel containment systems materials with alcohol blended fuels.

(1) The wording for this section is similar to the wording proposed in F202-09/10 which was DISAPPROVED by the Committee because "this proposal would limit the use of all aboveground and underground, inside and outdoor steel tanks or require them to be lined, including retroactivity".

The change would require the exclusive use of gold or gold lined tanks and components as gold is the ONLY metal that resists galvanic corrosion. Additionally, although the IFC Committee stated the action denying F202 was not in conflict with the action taken in F173, it obviously has now created a potential conflict in code requirements.

(2) The proponent stated that this change would increase the cost of construction. This is more than true. Requiring gold or other inert material and/or requiring lined tanks and components or other approved means of galvanic action mitigation (such as cathodic protection systems) particularly if applied retroactively, and replacing or retrofitting all existing tanks, piping and associated equipment is COST PROHIBITIVE.

Proponent also stated that this change is similar to wording in 3403.6.5. However 3603.6.5 only covers piping for which EXTERNAL corrosion protection has always been required. This proposal would require INTERNAL corrosion protection (gold plated or linings) and extends coverage to ALL tanks, piping, dispensers, hoses, pumps, connectors, nozzles and any other fluid handling equipment and devices NOT just to piping. .

(3) A Task Group assigned to study a similar issue at the last NFPA 30 Committee meeting in December 2010, reached the following conclusions supporting the position that galvanic act ion with blended fuels is not a substantive problem:

(a) The Steel tank Institute reported they could not recollect any piece of equipment that could not be subject to galvanic corrosion or cracking, whether it be steel, plastic, or elastomeric, (only gold is not afflicted). Therefore, if the new Section 2206.8.2 remains in the code, all existing tanks, equipment and appurtenances handling blended fuels would have to be replaced and all new items would have to be gold or lined with . .

(b) IFC already requires inspection, monitoring and maintenance of tanks and appurtenances and NFPA 30 has similar requirements in Sections 21.8, 22.17, and 23.17. These requirements assure corrosion is monitored and controlled. Additionally, EPA has strict requirements for monitoring leakage (and to take subsequent corrective action). These requirements have been effective to date in controlling corrosion related leakage.

(c) There is a lack of known failures with existing E85 tanks. The only cracking of steel tanks systems where alcohol content exceeds 10% is with denatured ethanol (approximately 97% ethanol) in large terminal tank facilities and loading racks. API has a document 939 (D and E) that discusses this phenomenon. It is not occurring in shop-fabricated tanks, or with E85 storage tanks in the existing marketplace, or at ethanol producers facilities, or in transport barges with steel tanks, or in railroad transport containers. So it has been a very isolated event, and certainly not worthy of an annual inspection on all tank systems and all tank equipment.

(4) NFPA 30 23.3.4, 23.3.4.1 and 23.3.4.2 (2008) which covers protection of tanks and piping, allows the AHJ to waive requirements where engineering evaluations have evidenced that corrosion does not occur. Information is available from industry studies, surveys and testing conducted by the API (American Petroleum Institute), STI (Steel Tank Institute) and other industry associations to assist AHJs in their determination. These all indicate that corrosion in tanks and piping containing alcohol based fuels is minimal.

(5) Section 2206.8.1 already requires equipment to be listed or approved. UL has a listing for dispensers using E85 fuels. AHJ approval can be similar to that initiated by the State of Illinois Fire Marshal, as follows (in part):

"The agency will only permit the distribution of a blended fuel in those tanks and piping that have been certified by the manufacturer or registered professional engineer as compatible with the blended fuel that will be stored"

"In lieu of such certification from the manufacturer or registered professional engineer, the OSFM will permit a blended fuel to be stored in steel tanks, single wall and double wall fiberglass tanks manufactured after 1991, or any tank that has been certified by a registered professional engineer as compatible with the blended fuel".

"The associated piping must be steel, fiberglass piping manufactured after 1991 or piping that was certified by a registered professional engineer as compatible with the blended fuel."

"In lieu of such certification from the manufacturer or registered professional engineer as to the compatibility of the material, the OSFM will permit the use of such ancillary equipment provided the equipment is inspected on a yearly basis by a licensed contractor."

"The owner/operator must also maintain at the facility location maintenance and inspection documentation from the licensed contractor that the ancillary equipment has been inspected and in good operating condition for use with the blended fuel being distributed"

(6) The proposed change is totally unnecessary. The majority of service stations are independently owned (or leased) and owners and operators are responsible for tanks, piping, dispensers, hoses, nozzles and appurtenances. This totally unnecessary proposed change would place a tremendous burden on these small business men and women as there is no way that they could comply (gold plated or lined equipment, indeed) and remain in business. The adherence of these responsible service station owners and operators to existing fire code, regulatory and industry requirements to monitor, inspect and maintain equipment and to control and mitigate any leakage has been commendable over the past years.

Commenter's Reason (SHAPIRO): Material compatibility is not an issue that should be dealt with uniquely in Chapter 22. The general requirements for material compatibility to prevent excessive corrosion are contained in Section 3403.6.5, where they apply to all piping systems.

As written, the proposed Section 2206.8.2 suggests that a tank in contact with an alcohol blended fuel must be fabricated from corrosion resistant materials, which essentially eliminates the permissible use of steel tanks for these fuels unless they are lined to prevent fluid contact with the tank shell. In addition, the text considered in Baltimore also prohibits steel tanks because they are subject to corrosion from external sources. Such corrosion can be (and is routinely) limited and controlled by cathodic protection and other methods, but these other methods are not recognized or permitted by the proposed text (note that the IFC addresses corrosion protection methods for all tanks in 3404.2.7.9, so there is no need for unique treatment in Chapter 22).

In discussion with the proponent, I was told that the main concern is preventing excessive corrosion that may occur when dissimilar metals are joined in the presence of a conductive liquid. This is certainly a valid issue for the code to deal with, but the code already addresses it in Section 3403.6.5, which regulates fuel dispensing systems along with all other flammable liquid piping.

Public Comment 2:

Jeffrey Shapiro, International Code Consultants representing Steel Tank Institute, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

ALCOHOL BLENDED FUELS. ~~Alcohol blended fuels, including those containing nominally 85-percent ethanol 15-percent unleaded gasoline (E85), are f~~ Flammable liquids consisting of 10-percent or greater, by volume, ethanol or other alcohols blended with gasoline ~~greater than 10-percent by volume~~.

(Portions of the proposal not shown remain unchanged.)

Commenter' s Reason: This comment is provided as an editorial rewrite of the definition, which is not in proper definition format as it was approved in Baltimore (or for that matter, in the 2009 code). There is no intent to change the technical provisions from what was approved in Baltimore. The current reference to E85 (85-percent alcohol and 15 percent gasoline) in the definition has been deleted because it is unneeded and potentially confusing. The definition states that any alcohol-gasoline mixture with 10-percent or more alcohol is an "alcohol blended fuel." With E85 being 85-percent alcohol (well above the 10-percent threshold), it makes no sense to specifically name E85 in the definition versus other ethanol blends, such as E15.

Final Action: AS AM AMPC____ D

F175-09/10
2209.2.2, Table 2209.2.2 (New), Chapter 47

Proposed Change as Submitted

Proponent: Julie Cairns, CSA America, Inc., representing CSA America Automotive Technical Committee

1. Revise as follows:

2209.2.2 Listed equipment. Hoses, hose connections, compressors, hydrogen generators, dispensers, detection systems and electrical equipment used for hydrogen shall be *listed* for use with hydrogen in accordance with the applicable standard in Table 2209.2.2. Hydrogen motor fueling connections shall be *listed* and *labeled* for use with hydrogen.

TABLE 2209.2.2
HYDROGEN HANDLING COMPONENT STANDARDS

HYDROGEN HANDLING COMPONENT	STANDARD
Compressed Hydrogen Dispensers	CSA America HGV 4.1
Hoses and Hose Assemblies for Gaseous Hydrogen Vehicles and Dispensing Systems	CSA America HGV 4.2
Breakaway Devices for Hoses Used in Compressed Hydrogen Vehicle Fueling Stations	CSA America HGV 4.4
Priority and Sequencing Equipment for Gaseous Hydrogen Dispensing Systems	CSA America HGV 4.5
Manually Operated Valves Used in Gaseous Hydrogen Vehicle Fueling Stations	CSA America HGV 4.6
Standard for Automatic Pressure Operated Valves for Use in Gaseous Hydrogen	CSA America HGV 4.7

Vehicle Fueling Stations	
Hydrogen Gas Vehicle Fueling Station Compressor	CSA America HGV 4.8
Fittings for Compressed Hydrogen Gas and Hydrogen Rich Gas Mixtures	CSA America HGV 4.10

2. Add new standards to Chapter 47 as follows:

CSA America, Inc.
8501 E. Pleasant Valley Rd.
Cleveland, OH 44131

HGV 4.1 Compressed Hydrogen Dispensers
HGV 4.2 Hoses and Hose Assemblies for Gaseous Hydrogen Vehicles and Dispensing Systems
HGV 4.4 Breakaway Devices for Hoses Used in Compressed Hydrogen Vehicle Fueling Stations
HGV 4.5 Priority and Sequencing Equipment for Gaseous Hydrogen Dispensing Systems
HGV 4.6 Manually Operated Valves Used in Gaseous Hydrogen Vehicle Fueling Stations
HGV 4.7 Standard for Automatic Pressure Operated Valves for Use in Gaseous Hydrogen Vehicle Fueling Stations
HGV 4.8 Hydrogen Gas Vehicle Fueling Station Compressor
HGV 4.10 Fittings for Compressed Hydrogen Gas and Hydrogen Rich Gas Mixtures

Reason: The proposal is to reference CSA America documents used by industry for certification of the dispenser and related equipment.

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

Analysis: A review of the standard(s) proposed for inclusion in the code, CSA HGV 4.1, 4.2, 4.4, 4.5, 4.6, 4.7, 4.8 and 4.10, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: CAIRNS-F1-2209.2.2

Public Hearing Results

Note: The following analysis was not in the Code Change monograph but was published on the ICC website at http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf :

Analysis: Drafts of the proposed CSA HGV 4 standards were not submitted for review.

Committee Action: **Disapproved**

Committee Reason: The documents proposed as referenced standards are still in draft form and were not submitted to staff or the committee for review.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Robert W. Boyd, The Linde Group, representing the Hydrogen Industry Panel on Codes; Julie Cairns, CSA America, Inc, representing CSA America, Automotive Technical Committee; and Larry Fluer, Fluer, Inc. and Pat McLaughlin, McLaughlin & Associates, representing the Compressed Gas Association, request Approval as Modified by this Public Comment.

Modify the proposal as follows:

2209.2.2 Listed or approved equipment. Hoses, hose connections, compressors, hydrogen generators, dispensers, detection systems and electrical equipment used for hydrogen shall be *listed* or approved for use with hydrogen ~~in accordance with the applicable standard in Table 2209.2.2.~~ Hydrogen motor fueling connections shall be *listed* and *labeled* or approved for use with hydrogen.

~~**TABLE 2209.2.2**~~
~~**HYDROGEN HANDLING COMPONENT STANDARDS**~~

~~**HYDROGEN HANDLING COMPONENT**~~	~~**STANDARD**~~
~~Compressed Hydrogen Dispensers~~	~~CSA America HGV 4.1~~

~~Hoses and Hose Assemblies for Gaseous Hydrogen Vehicles and Dispensing Systems~~	~~CSA America HGV 4.2~~
~~Breakaway Devices for Hoses Used in Compressed Hydrogen Vehicle Fueling Stations~~	~~CSA America HGV 4.4~~
~~Priority and Sequencing Equipment for Gaseous Hydrogen Dispensing Systems~~	~~CSA America HGV 4.5~~
~~Manually Operated Valves Used in Gaseous Hydrogen Vehicle Fueling Stations~~	~~CSA America HGV 4.6~~
~~Standard for Automatic Pressure Operated Valves for Use in Gaseous Hydrogen Vehicle Fueling Stations~~	~~CSA America HGV 4.7~~
~~Hydrogen Gas Vehicle Fueling Station Compressor~~	~~CSA America HGV 4.8~~
~~Fittings for Compressed Hydrogen Gas and Hydrogen Rich Gas Mixtures~~	~~CSA America HGV 4.10~~

~~**CSA America, Inc.**~~
~~**8501 E. Pleasant Valley Rd.**~~
~~**Cleveland, OH 44131**~~

~~HGV 4.1 Compressed Hydrogen Dispensers~~
~~HGV 4.2 Hoses and Hose Assemblies for Gaseous Hydrogen Vehicles and Dispensing Systems~~
~~HGV 4.4 Breakaway Devices for Hoses Used in Compressed Hydrogen Vehicle Fueling Stations~~
~~HGV 4.5 Priority and Sequencing Equipment for Gaseous Hydrogen Dispensing Systems~~
~~HGV 4.6 Manually Operated Valves Used in Gaseous Hydrogen Vehicle Fueling Stations~~
~~HGV 4.7 Standard for Automatic Pressure Operated Valves for Use in Gaseous Hydrogen Vehicle Fueling Stations~~
~~HGV 4.8 Hydrogen Gas Vehicle Fueling Station Compressor~~
~~HGV 4.10 Fittings for Compressed Hydrogen Gas and Hydrogen Rich Gas Mixtures~~

Commenter's Reason (BOYD/CAIRNS): Equipment used for hydrogen may not always be listed or listed and labeled given the evolving nature of hydrogen technologies. An alternate provision that the equipment be approved provides the fire code official with a means to regulate hydrogen equipment installations and is consistent with section 2703.2.3 which provides that equipment and machinery associated with the use of hazardous materials be listed or approved. The original proposal attempted to provide both the code official and industry tools to use for the installation of hydrogen motor fuel facilities, however, the standards listed have not completed the consensus process. This public comment will allow code officials and industry to apply the standards once they have completed the process by inserting the words "or approved" to match existing language for other hazardous material activities.

The original proponent of F175, Julie Cairns of CSA International, is in support of this public comment. In addition, HIPOC has been in contact with CGA who submitted an identical public comment. We are in support of this change and wish to reflect that CGA, CSA, and HIPOC all support this public comment.

Commenter's Reason (FLUER/McLAUGHLIN): The proposed new CSA standards are not yet standards so they were removed from the proposal. Currently there are no listing standards for many of the items included in the list of equipment which may be utilized in this application, including, compressors, generators and dispensers. On the other hand, motor fueling connections are listed. This modification resolves the lack of listing standards by adding "or approved", and thus will accomplish the submitter's intent by allowing the local authority to approve the equipment using CSA America, Inc. HGVs or other approved standards when they are ultimately published.

Final Action: AS AM AMPC____ D

F179-09/10

2301.5 (New), 2302 (New), 2303.2, 2303.6, 2308.2.1, Chapter 47

Proposed Change as Submitted

Proponent: Jimbo Schifiliti, Fire Safety Consultants, Inc., representing self

1. Add new text as follows:

2301.5 Pallets. All pallets shall be wooden as defined by this Chapter or shall be *listed* and *labeled* in accordance with UL 2335 or FM 4996

SECTION 2302
DEFINITIONS

2302.1 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.

WOODEN PALLET. A wooden pallet is defined as a 42 in. x 42 in., 2-way entry Stringer Pallet constructed from hardwood as described in ASME MH1.

2. Revise as follows:

2303.2 Class I commodities.Class I commodities are essentially noncombustible products ~~on wooden or nonexpanded polyethylene solid deck~~ with or without pallets , in ordinary corrugated cartons with or without single-thickness dividers, or in ordinary paper wrappings with or without pallets. Class I commodities are allowed to contain a limited amount of Group A plastics in accordance with Section 2303.7.4. Examples of Class I commodities include, but are not limited to, the following:

Alcoholic beverages not exceeding 20-percent alcohol
Appliances noncombustible, electrical
Cement in bags
Ceramics
Dairy products in nonwax-coated containers (excluding bottles)
Dry insecticides
Foods in noncombustible containers
Fresh fruits and vegetables in nonplastic trays or containers
Frozen foods
Glass
Glycol in metal cans
Gypsum board
Inert materials, bagged
Insulation, noncombustible
Noncombustible liquids in plastic containers having less than a 5-gallon (19 L) capacity
Noncombustible metal products

2303.6 High-hazard commodities. High-hazard commodities are high-hazard products presenting special fire hazards beyond those of Class I, II, III or IV. Group A plastics not otherwise classified are included in this class. Examples of high-hazard commodities include, but are not limited to, the following:

Aerosol, Level 3 (see Chapter 28)
Alcoholic beverages, exceeding 80-percent alcohol, in bottles or cartons
Commodities of any class in plastic containers in carousel storage
Flammable solids (except solid combustible metals)
Glycol in combustible containers (50 percent or greater)
Lacquers, which dry by solvent evaporation, in metal cans or cartons
Lubricating or hydraulic fluid in plastic containers
Mattresses, foam rubber or foam plastics
~~Pallets and flats which are idle combustible~~
Paper, asphalt, rolled, horizontal storage
Paper, asphalt, rolled, vertical storage
Paper and pulp, rolled, in vertical storage which is unbanded or not protected with an *approved* wrap
Pillows, foam rubber and foam plastics
Pyroxylin
Rubber tires
Vegetable oil and butter in plastic containers

2308.2.1 Plastic ~~pallets and~~ shelves. Storage on ~~plastic pallets or~~ plastic shelves shall be protected by *approved* specially engineered *fire protection systems*.

> ~~**Exception:** Plastic pallets listed and labeled in accordance with UL 2335 shall be treated as wood pallets for determining required sprinkler protection~~.

3. Add new standards to Chapter 47 as follows:

ANSI/FM 4996-2007	American National Standard for Classification of Idle Plastic Pallets as Equivalent to Wood Pallets
ASME MH1-2005	Pallets, Slip Sheets, and Other Bases for Unit Loads

Reason: Over the years the types of pallets utilized in day to day commerce has changed. When the density requirements relative to the impact pallets have on commodity classification and as idle pallet storage the standard wooden pallet was the hardwood, stringer type. Today a wooden

pallet may be a 9-block, 4-way, softwood type or other variations including “one-way” pallets of a mixture of wood and composites. Some pallets are plastic, some are a combination of plastic and wood products.

NFPA 13 has undergone revisions over the last several cycles to increase density requirements based upon test data for the newer wood pallets. In addition, NFPA 13 added definitions as follows:

> “3.10.12 Wood Pallet. A wood pallet is defined as a pallet constructed entirely of wood with metal fasteners.”
>
> “3.10.13 Plastic Pallet. A plastic pallet is defined as a pallet having any portion of its construction consisting of a plastic material.”

The new definitions serve as a partial solution in that the pallet is either wood or plastic, and if classified as plastic verification of whether or not it is a listed and labeled plastic pallet can be made.

But the changes in NFPA 13 do not address the entire problem. Though the more recent additions of NFPA 13 have had increases made to density requirements to handle the challenge of some of the newer wood pallet types or new construction projects, those densities do not cover all of the newer types of materials in use in pallets and do not address the fact that the pallets are in use in facilities built under early editions of NFPA 13 and as a result do not have the needed water flow densities.

> We have an additional problem in Chapter 23. Whereas NFPA 13 addresses the impact of pallets at “5.6.2 Pallet Types”, (which may require a one or two class commodity increase or specific laboratory testing), and at “12.12 Protection of Idle Pallets” regardless or storage method, (solid pile versus rack storage), the IFC only addresses the issue in relation to rack storage and by classifying “*Pallets and flats which are idle combustible*” as a High-hazard commodities.
>
> “2308.2.1 Plastic pallets and shelves. Storage on plastic pallets or plastic shelves shall be protected by approved specially engineered fire protection systems.
>
> Exception: Plastic pallets listed and labeled in accordance with UL 2335 shall be treated as wood pallets for determining required sprinkler protection”

This presents the real possibility that a building designed under the IFC did not have the correct commodity class for determining sprinkler density assigned unless the designer, plan reviewer and/or field inspector was aware of this issue and applied NFPA 13 to this topic even though classification is covered by the IFC.

In a practical sense, we cannot expect every existing building containing pallets with a fire suppression system installed prior to the 2002 edition of NFPA 13 to have the systems retroactively reassessed by a design professional and upgraded to handle the increased sprinkler demands of a violating product introduced after the building was constructed. It is easier and more cost effective to address the offending product, i.e., the unlisted or labeled pallet.

This proposal addresses the issue by requiring all pallets other than the hardwood, stringer type to be listed and labeled in accordance with the existing UL or FM standards. There is already one wood pallet provider that had their “yellow pine, 9-block” pallet tested for listed under the standards documenting that it can be done. In fact, it was some of those tests that identified the need to make changes to NFPA 13.

By requiring all pallets to be listed or labeled it will ensure that the pallets present can be handled by the existing suppression systems including those designed under the IFC where the required commodity class increase may have been missed and provide the code official with an effective tool to apply during maintenance inspections by spot checking for labels. It will also serve the building owner/operator by making it easy for him/her to verify that the pallets entering their facility do not place it at risk from a damaging fire.

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

Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI/FM 4996-2007 and ASME MH1-2005, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: SCHIFILITI-F1-2301.5.DOC

Public Hearing Results

Note: The following analysis was not in the Code Change monograph but was published on the ICC website at http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf :

Analysis: Review of the proposed new standard FM 4996-07 indicated that, in the opinion of ICC staff, the standard did not comply with ICC standards criteria, Section 3.6.2.1. ASME MH1-2005 was not submitted for review.

Committee Action: Disapproved

Committee Reason: The committee disapproved the proposal as it would severely limit the types of pallets allowed. A more generic approach was preferred versus allowing wood pallets in all cases but limiting other types of pallet through a testing procedure. In addition, the standard FM 4996 was noted by staff as not complying with the CP28 and ASME MH1 was not provided for review. This proposal would also remove idle pallets from the high hazard category which created concern for some committee members.

Assembly Action: None

Individual Consideration Agenda

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

Public Comment:

Bruce Torrey, representing Intelligent Global Pooling Systems, requests Approval as Modified by this Public Comment.

Replace the proposal as follows:

Add new definition to Section 2302.1 as follows:

WOODEN PALLET. A nominal 42 x 42 x 5 inch (1.07 x1.07 x 0.13 m) 2-way hardwood pallet.

Revise as follows:

2308.2.1 ~~Plastic~~ Pallets and shelves. Storage on combustible non-wooden ~~plastic~~ pallets or plastic shelves shall be protected by approved specially engineered fire protection systems .

Exception: ~~Plastic~~ Pallets listed and labeled in accordance with UL 2335 shall be treated as wooden pallets for determining required sprinkler protection.

Commenter's Reason: The 42 x 42 x 5 inch (1.07 x 1.07 x 0.13 m) 2-way hardwood pallet has and continues to be the standard test pallet used as the baseline pallet for virtually all Sprinkler and Commodity Classification testing [1]. Standard test commodities used for sprinkler and commodity fire testing/research are also configured to fit the 42 x 42 inch wood pallet footprint [2]. Since sprinkler design and commodity classification fire tests are based on the fire input of this particular pallet it is by default the baseline pallet; in the same manner that test commodities have been standardized. Changes in pallet material compositions, dimensions, and geometries beyond this standard "conventional pallet" can, and often do, introduce variables that change the standard fire exposure baseline for commodity and sprinkler testing, causing test failures [3]. Sprinkler design and protection based on the conventional 42 x 42 –inch 2-way pallet must take into account the variability in fire exposures by the use of untested pallets.

The use of the term "non-wood" provides definition for code application regarding untested plastic, and the growing number of hybrid pallets on the market. The term "combustible" differentiates between metal (steel/aluminum) pallets and combustible ones.

[1] [2]
National Quick Response Sprinkler Research Project: Large-Scale Fire Test Evaluation of Early Suppression Fast Response (ESFR) Automatic Sprinklers, NFPA, National Fire Protection Research Foundation, Factory Mutual Research Corporation.
http://www.nfpa.org/assets/files//PDF/Research/Group_1_Large-Scale_Fire_Tests_ESFR_Sprinkler.pdf, 4.1 Test Commodity, page 24 ("42-in x 42-in. x 5-in. high, ordinary, two-way, slatted hardwood pallet")

Underwriters Laboratories Inc., Report of In-Rack Sprinkler Comparison Fire Tests, NC183897NK31099, May,22 1999
http://fire.nist.gov/bfrlpubs/testdata/PDF/td005.pdf, 4.0 Test Commodity, page 5, pallet description, "42 by 42 x 5 in. high hardwood pallet"

LARGE SCALE TESTS OF SPRINKLER, VENT, DRAFT CURTAIN INTERACTION, National Institute of Standards and Technology, Underwriters Laboratories, Inc., http://fire.nist.gov/bfrlpubs/fire99/PDF/f99135.pdf, Page 3, (Pallet Description), "Two-way, 1.06 m by 1.06 m by 0.13 m (42 in by 42 in by 5 in) slatted deck hardwood pallets" supported the loads.

Using Large K-Factor Sprinklers For High-Challenge Fires, http://www.pmengineer.com/Articles/Feature_Article/BNP_GUID_9-5-2006_A_1000000000000167315, *Kerry M. Bell P.E., September 1, 2007,* "…..placed on a hardwood pallet." The two cartons have a combined nominal thickness of 1 inch and the nominal measurements for the outside carton are 42x42x42 inches.

Underwriters Laboratories, Inc., FIRE TESTS OF STORAGE PALLETS - UL 2335
http://ulstandardsinfonet.ul.com/tocs/tocs.asp?doc=s&fn=2335.toc
4 Commodity Storage Test, 4.1.2, "Each of the eight cartons shall measure 42 x 42 x 42 ±1 inch (1.1 x 1.1 x 1.1 ±0.02 m)". "The Class II commodity shall have a documented class rank between 1.75 and 2.25 when tested on 42 x 42 x 5 inch (1.07 x 1.07 x 0.13 m) 2-way hardwood pallets."

Factory Mutual, FM 4995 Approval Standards for Classification of Idle Plastic Pallets" Appendix A, pg. 17, "A typical pallet is made from hardwood and measure approximately 42 in. x 42 in. x 5 in…." http://www.fmglobal.com/assets/pdf/fmapprovals/4995.pdf

National Wholesale/Retail Occupancy Fire Research Project, Technical Report, Task 1, National Fire Protection Research Foundation, 1993, Underwriters Laboratories Project 92NK9354/NC987, pg. 4, 5 http://www.nfpa.org/assets/files//PDF/Research/Wholesale-Retail_Occupancy_Flammable_Liquids.pdf

Controlling Parameters Involved in the Burning of Standard Storage Commodities: A fundamental approach towards fire-hazard classification, Department of Mechanical & Aerospace Engineering University of California, San Diego
http://maeresearch.ucsd.edu/~mgollner/publications/2009_CSSCIpaper_Gollner.pdf

[3]
National Oxidizing Pool Chemicals Storage Fire Test Project, National Fire Protection Research Foundation, Underwriters Laboratories, Inc., pg. 21-22, http://www.nfpa.org/assets/files//OxidizingPoolChemicals.pdf

National Institute of Standards and Technology, HSB Industrial Risk Insurers, CHEP, Underwriters Laboratories, Inc., NC1838-97NK31290, 1998, Fire Tests on Wooden Pallets, http://www.fire.nist.gov/bfrlpubs/testdata/art003.html

Supporting Data Needs for NFPA Automatic Sprinkler Committees Research Project, pg. 15, "However, multiple variables were changed as slave type pallet were also used (standard configuration used standard pallets)", http://www.nfpa.org/assets/files//PDF/Research/Single_Point_Sprinkler.pdf

Final Action: AS AM AMPC____ D

F180-09/10
2302.1

Proposed Change as Submitted

Proponent: Ron Clements, Chesterfield County Virginia Building Inspection Department, representing self

Revise as follows:

2302.1 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.

HIGH-PILED STORAGE AREA. An area within a building which is designed, intended, proposed or actually used for high-piled combustible storage. The area of aisles is not included in the determination of the size of the high-piled storage area.

Reason: There is some ambiguity regarding if the area of aisles within high piled storage areas is to be included in the high-piled storage area value used by this chapter per this definition. Section 2306.9.1.1 bases some required aisle widths on the high-piled storage area. If the aisle widths area required to be included in the high piled storage area by definition, then it would be mathematically impossible to calculate the high-piled storage area because you cannot determine the aisle widths needed to calculate the aisle areas without the high-piled storage area. Additionally it does not make sense to include large aisles widths of 20', 30' or more between storage racks as part of the storage area. Clearly the intent is to measure the actual area of floor that is covered by the stored commodity.

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

ICCFILENAME: CLEMENTS-F1-2302.DOC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved as it was felt that aisles are an integral part of the fire protection in a warehouse and should not be excluded in the definition.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Ron Clements, Chesterfield County Virginia Building Inspection Department, representing self, requests Approval as Submitted.

Commenter's Reason: The Committee Reason was **"**The proposal was disapproved as it was felt that aisles are an integral part of the fire protection in a warehouse and should not be excluded in the definition." Clearly that reason does not address the issue raised by my original reason statement. Yes the aisles are part of the overall design but Section 2306.9.1.1 bases some required aisle widths on the high-piled storage area. If the aisle widths area required to be included in the high piled storage area by definition, then it would be mathematically impossible to calculate the high-piled storage area because you cannot determine the aisle widths needed to calculate the aisle areas without the high-piled storage area. The committee reasoning also did not address the issue of large spaces between aisles as discussed in the original reason statement.

Final Action: AS AM AMPC____ D

F183-09/10
2308.2.1, Chapter 47

Proposed Change as Submitted

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing FM Approvals

1. Revise as follows:

2308.2.1 Plastic pallets and shelves. Storage on plastic pallets or plastic shelves shall be protected by approved specially engineered fire protection systems.

Exception: Plastic pallets listed and labeled in accordance with UL 2335 or ANSI/FM 4996 shall be treated as wood pallets for determining required sprinkler protection.

2. Add new standard to Chapter 47 as follows:

FM

ANSI/FM 4996-2007	American National Standard for Classification of Idle Plastic Pallets as Equivalent to Wood Pallets

Reason: The purpose of this code change is to include reference to ANSI/FM 4996 as an alternate to UL 2335 in the International Fire Code. ANSI/FM 4996 is an ANSI approved standard.

The inclusion of this alternate test method would provide the authority having jurisdiction with the flexibility to accept listed and labeled products evaluated in accordance with either UL 2335 or ANSI/FM 4996. This will also assist pallet manufacturers by providing two sources of listings and also not require pallet manufacturers currently listed with FM to have to retest and co-list with another laboratory/agency.

Both standards are similar in that they require full-scale fire tests and they address the issue of appropriate sprinkler protection for plastic pallets.

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, ANSI/FM 4996-2007, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: BEITEL-F1-2308.2.1.DOC

Public Hearing Results

Note: The following analysis was not in the Code Change monograph but was published on the ICC website at http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf :

Analysis: Review of the proposed new standard FM 4996-07 indicated that, in the opinion of ICC staff, the standard did not comply with ICC standards criteria, Section 3.6.2.1.

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved based both upon the action on code change F179-09/10 and also per the proponents request. Additionally, the standard was noted by staff as not complying with ICC CP28.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment 1:

Jesse J. Beitel, Hughes Associates, Inc., representing FM Approvals, requests Approval as Modified.

Modify the proposal as follows:

ANSI/FM 4996-2010 ~~2007~~ American National Standard for Classification of Idle Plastic Pallets as Equivalent to Wood Pallets

(Portions of the proposal not shown remain unchanged)

Commenter's Reason: Since the submitted edition of ANSI/FM Standard 4996 did not meet the ICC Standard's criteria, this proposal was disapproved. It is anticipated that the ANSI/FM 4996, 2010 edition will be revised in early April, 2010 and be published and be available for review prior to the Final action hearings.

The standard will be provided for review as soon as possible.

Analysis: Note that section 3.6.3.1 of CP28-05 requires that the standard be completed and readily available prior to Final Action Consideration. The final action of this proposal will occur May 14-23, 2010.

Public Comment 2:

Bruce Torrey representing Intelligent Global Pooling Systems, requests Disapproval.

Commenter's Reason: The recognition of ANSI/FM 4996 as an alternate test protocol to ANSI/UL 2335 is not appropriate. Industry testing has demonstrated that plastic pallets can, and often do, influence commodity classification by one, two or more classes [1]. NFPA 13 also recognizes the importance of commodity class testing by penalizing plastic pallets in commodity classification unless testing is performed on the commodity unit, Chapter 5 of NFPA 13. The ANSI/FM 4996 test protocol does not evaluate the influence of plastic pallets on commodities. As stated in section 1,1 Purpose, of ANSI/FM 4996, "This standard states test requirements for fire hazard classification of idle plastic pallets as equivalent to wood pallets." More specifically this standard evaluates the fire performance of idle plastic pallets in racks; which is addressed in Chapter 12, section 12.12.2.3.1 of NFPA 13 [2], "When specific test data and a product listing are available, the data shall take precedence in determining the required protection of idle plastic pallets stored in racks."

The title and purpose statement within FM 4996 states the limitation of the standard to the assessment of idle plastic pallets [3]. ANSI/UL 2335 however, addresses both commodity classification jump potential as well as idle stacked plastic pallets for proper sprinkler protection [4]. ICC Policy, Section 3.6.2.2 also states - The standard shall be appropriate for the subject covered. ANSI/FM 4996 only assesses the idle rack storage of plastic pallets and should not be referenced as an equivalent to UL 2335.

[1] Material Handling Industry of America, RCPA Fire Test Task Group Report, http://www.mhia.org/industrygroups/rpcpa/firesafety

[2] National Fire Protection Association, NFPA 13 – 2007, Section 12.12.2.3, "Idle plastic pallets shall be stored only in racks where protected in accordance with the requirements of Table 12.12.2.1.", Section 12.12.2.3.1 states, "When specific test data and a product listing are available, the data shall take precedence in determining the required protection of idle plastic pallets stored in racks".

[3] American National Standard for Classification of Idle Plastic Pallets as Equivalent to Wood Pallets, ANSI/FM Approvals 4996, 2007, pg 1, 1.1, Purpose: "This standard states test requirements for fire hazard classification of idle plastic pallets as equivalent to wood pallets." http://www.fmglobal.com/assets/pdf/fmapprovals/4996ansi.pdf

[4] UL 2335 Fire Tests of Storage Pallets, ANSI/UL 2335, 2004, pg. 5 Scope: "This standard measures the fire performance of pallets in idle palletized and rack storage arrangements."

Final Action: AS AM AMPC____ D

F184-09/10
2308.3.1 (New)

Proposed Change as Submitted

Proponent: Amber Anderson/Stuart Tom, Cosumnes CSD Fire Department, representing California Fire Chief's Association

Add new text as follows:

2308.3.1 Flue space protection. Where required by the fire code official, flue spaces required by Table 2308.3, in single, double or multiple row rack storage installations shall be equipped with approved devices to protect the required flue spaces. Such devices shall not be removed or modified.

Reason: This proposal authorizes the enforcing agency to require devices, when appropriate, to maintain the required flue spaces in rack storage systems found in IFC Section 2308 and IFC Table 2308.3. It is not the intent of this proposal to require such devices in each instance, but rather when the business practice has established a history of poor flue space maintenance.

Approved devices to protect required flue spaces may be any of the following: brackets, cables or other elements that are securely fastened to the load bearing columns of racks, which control the depth or width to which a product, pallet or similar material can be stored in the rack system thereby preventing obstruction of the required flue space.

Once approved devices are installed, most business owner confusion regarding flue space requirements are removed. Other benefits include; property loss reduction through quick activation of the fire protection system; improved penetration of extinguishing agent through the rack system to the seat of the fire; faster activation of smoke and heat vent systems, improved employee safety, public safety and firefighter safety.

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

ICCFILENAME: ANDERSON-TOM-F1-2308.3.1.DOC

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The proposal was approved as it provides a necessary tool to address an ongoing problem of maintaining flue spaces in a rack configuration in high-piled storage applications.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Tracey D. Bellamy, Telgian Corporation, representing self, requests Disapproval.

Commenter's Reason: Without the existence of a specific directive as to appropriate measures upon which approval can be based or consensus design application for such devices, the section is subject to substantial misapplication. This could potentially give rise to other unintended material handling issues or misguided installations.

Final Action: AS AM AMPC____ D

F186-09/10
Table 2703.1.1(1) [IBC [F] Table 307.1(1)]; 3302.1 (IBC [F]307.2)

Proposed Change as Submitted

Proponent: Glenn A. Dean, Virginia State Fire Marshal's Office

Revise as follows:

TABLE 2703.1.1(1) [IBC TABLE [F] 307.1(1)]
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a,j,n,p]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEM[b]			USE-OPEN SYSTEMS	
			SOLID POUNDS (CUBIC FEET)	LIQUID GALLONS (POUNDS)	GAS (CUBIC FEET AT NTP)	SOLID POUNDS (CUBIC FEET)	LIQUID GALLONS (POUNDS)	GAS (CUBIC FEET AT NTP)	SOLID POUNDS (CUBIC FEET)	LIQUID GALLONS (POUNDS)
~~Consumer fireworks (Class C, Common)~~	~~1.4G~~	~~H-3~~	~~125[d,e,l]~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~

(Portions of table and notes not shown remain unchanged)

3302.1 (IBC [F]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.

FIREWORKS, 1.4G. (Formerly known as Class C, Common Fireworks.) Small fireworks devices containing restricted amounts of pyrotechnic composition designed primarily to produce visible or audible effects by combustion or deflagration that complies~~. Such 1.4G fireworks which comply~~ with the construction, chemical composition and labeling regulations of the DOTn for Fireworks, UN 0336, and the U.S. Consumer Product Safety Commission as set forth in CPSC 16 CFR: Parts 1500 and 1507,~~ are not explosive materials for the purpose of this code~~.

(Portions of definition of "Fireworks" not shown remain unchanged)

Reason: The intent of this change is to revert to language stating consumer fireworks are explosive in nature.

The IFC definition language denoting that consumer fireworks would not be considered "explosive materials for the purpose of this code" originated through IFC code change F97-99. The proponent at the time stated the change was to "revise the definitions for consumer fireworks and

display to be more closely aligned with the definitions contained in the 1997 IFCI Uniform Fire Code including 1999 Accumulative Supplement and the 1999 BOCA National Fire Prevention Code."

In looking back for the UFC and BOCA fire codes that were referenced in the F97-99 change to the IFC, code change B3-97 introduced language through the BOCA building code claiming consumer fireworks are not explosive materials and did not provide any technical substantiation to support the claim. I would accept the proponent was making the claim as a means to justify reclassifying the storage and/or sale of consumer fireworks from an H-1 to an H-3 building. For that, I would agree somewhat with the proponent in saying that it "appears reasonable" given the comparison for other H-3 commodities but that is not the issue in this proposed change.

The next BOCA cycle saw the introduction of F18-98 changing the definition of consumer fireworks, 1.4G as "not explosive materials for the purpose of this code". The committee hearing the change at the time denied the proposal with a conference action to amend. Subsequently the proponent brought the issue back in the form of an amendment. But here again, a technical substantiation was not provided.

This same F18-98 change, as amended, carved out consumer fireworks from BOCA's MAQ table to "correlate with code change B3-97 to the 1996 BOCA National Building Code" to be shown as a Group H-3 building instead of a Group H-1. The proponent also stated that it was to "correlate definitions used in the BOCA National Fire Prevention Code and Building Code with terminology used in the new DOTn/UN classifications and regulations and NFPA standards." That may be true to a point and it's that point that gets to the heart of the reason behind this proposed change, which is, DOTn 49 CFR Parts 100-178, U.S Consumer Products Safety Commission as set forth in CPSC 16 CFR, UN 0336, NFPA standards 495, 1123, 1124, and 1126 **do not** contain language saying consumer fireworks are not explosive, at least not that I found. I went so far as to check pamphlets published by the Institute of Makers of Explosives; the U.S. Department of Justice, Bureau of Alcohol, Tobacco, Firearms and Explosives, AFT Publication 5400.7; the American Pyrotechnics Association Standard 87-1, and found nothing in that respect. In fact, everything found labels fireworks as "explosive" without distinction for 1.4G "consumer fireworks" versus a 1.4G professional pyrotechnic device such as the "gerb" that was used and ignited The Station nightclub fire in Rhode Island.

It is the accumulative results of B3-97 and F18-98 that lent itself to the reference in IFC code change F97-99 supporting statement.

That portion of the proposed definition change to include "deflagration" is a resurrection of a previously used descriptor and is to more accurately reflect the functioning of some consumer fireworks. While a sparkler or fountain may operate through combustion, simple combustion does not necessarily mean enough force will be produced quickly enough for the device to function in a desired manner. If the pyrotechnic material does not deflagrate, the flaming balls of roman candles may not launch; aerial devices may not have enough expelling force to obtain the needed altitude.

The change to Table 2703.1.1(1) is a change to reflect that consumer fireworks are indeed properly classified as an Explosive 1.4G and it's not necessary to have a separate line with identical threshold values, including all footnotes, to determine at what point a building would be classified as a Group H-3. It's redundant within the same table. In reality, at the model code level, other than the deletion of language saying consumer fireworks are not explosive, the net effect of this change will be zero to what is taking place in the world of consumer fireworks manufacturing, storage, sale and use.

At the time of this submission I have not located copies of the UFC code changes referenced above but I suspect the supporting statements closely resembled those submitted to BOCA.

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

ICCFILENAME: DEAN-F1-TABLE 2703.1.1(1).DOC

Public Hearing Results

Committee Action: Approved as Modified

Modify the proposal as follows:

3302.1 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.

EXPLOSIVE. A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, igniters and display fireworks, 1.3G (Class B, Special).

~~The term "Explosive" includes any material determined to be within the scope of USC Title 18: Chapter 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G (Class C, Common) by the hazardous materials regulations of DOTn 49 CFR Parts 100-185.~~

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

Committee Reason: The committee agreed with the proponent's reason statement and felt that the proposal removes an unnecessary redundancy in the table. The modification completes the code change since the 2009 edition was not available when the proponent prepared the code change and also removes potential conflict between the fireworks and explosives definitions.

Assembly Action: None

Individual Consideration Agenda

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

Public Comment 1:

Rick Thornberry, PE, The Code Consortium, Inc. representing American Pyrotechnics Association (APA), requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

TABLE 2703.1.1(1) [IBC TABLE [F] 307.1(1)]
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a,j,n,p]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEM[b]			USE-OPEN SYSTEMS	
			SOLID POUNDS (CUBIC FEET)	LIQUID GALLONS (POUNDS)	GAS (CUBIC FEET AT NTP)	SOLID POUNDS (CUBIC FEET)	LIQUID GALLONS (POUNDS)	GAS (CUBIC FEET AT NTP)	SOLID POUNDS (CUBIC FEET)	LIQUID GALLONS (POUNDS)
Consumer fireworks	1.4G	H-3	125[d,e,f]	N/A	N/A	N/A	N/A	N/A	N/A	N/A

(Portions of table and notes not shown remain unchanged)

3302.1 (IBC [F]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.

EXPLOSIVE. A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, igniters and display fireworks, 1.3G ~~(Class B, Special)~~.

The term "Explosive" includes any material determined to be within the scope of USC Title 18: Chapter 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G (Class C, Common) by the hazardous materials regulations of DOTn 49 CFR Parts 100 – 185.

FIREWORKS, 1.4G. ~~(Formerly known as Class C, Common Fireworks.)~~ Small fireworks devices containing restricted amounts of pyrotechnic composition designed primarily to produce visible or audible effects by combustion ~~or deflagration that complies~~. Such 1.4G fireworks which comply with the construction, chemical composition and labeling regulations of the DOTn for Fireworks, UN 0336 as set forth in DOTn 49 CFR: Part 172, and the U.S. Consumer Product Safety Commission as set forth in CPSC 16 CFR: Parts 1500 and 1507, are not explosive materials for the purpose of this code.

(Portions of the definition of "Fireworks" not shown remain unchanged)

Commenter's Reason: This Public Comment basically reinstates the current definitions for "Explosive" and "Fireworks, 1.4G" with some additional revisions to further clarify them to make them more consistent with the DOTn regulations for them.

This Public Comment also reinstates the entry in Table 2703.1.1(1) for Consumer Fireworks, 1.4G based on it being a defined term that is distinctive from Explosives, 1.4G by its definition.

It should also be noted that a very significant, unintended consequence will result if Code Change F186-09/10 is approved as modified by the Committee without further modification by this Public Comment regarding the definition for "Explosive" because of the deletion of the second paragraph of the definition which currently includes materials within the scope of USC Title 18: Chapter 40, as well as materials classified as an explosive by the Hazardous Materials Regulations of DOTn 49 CFR: Parts 100 – 185. The inclusion of that paragraph within the definition for "Explosive" is also consistent with the definition for "Explosive Material" found in Section 3.3.98 of the 2009 NFPA 1 Fire Code including the Annex Note A.3.3.98, as well as with the definition for "Explosive" in Section 3.3.18 of NFPA 495 Explosive Materials Code (2006) including the Annex Note A.3.3.18. This paragraph is important to complete the definition for "Explosive" to be consistent with federal regulations.

This Public Comment also further revises the current definition for "Fireworks, 1.4G" to include a reference to DOTn 49 CFR: Part 172 which makes the definition consistent with the definition currently contained in NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles (2006), as well as with the definition for "Consumer Fireworks" in the Bureau of Alcohol, Tobacco, Firearms and Explosives (BATF) Federal Explosives Law and Regulations, ATF Publication 5400.7 (November 2007). Contrary to the proponent's Reason Statement, the current definition for "Fireworks, 1.4G" is totally consistent with the definitions in NFPA 1123 and NFPA 1124. And as noted previously, although not mentioned in the submitter's statement, the definition is also totally consistent with that contained in the NFPA 1 Fire Code (2009) including the Annex Note. The definition in NFPA 1123 is extracted from NFPA 1124 and the Annex Note to that definition in Section A.3.3.15.1 includes the following: "Consumer fireworks contain limited quantities of pyrotechnic composition per unit and do not pose a mass explosion hazard where stored. Therefore, they are not required to be stored in a magazine." The Annex Note to the definition for "Consumer Fireworks" in NFPA 1124-2006 in Section A.3.3.30.1 states: "Consumer fireworks… are not considered to be explosive materials for the purposes of this code." Similarly, the Annex Note to the definition for "Consumer Fireworks" in the NFPA 1 Fire Code (2009) Section A.3.3.115.1 contains the same statement. Also, the Annex Note to the definition for "Explosive Material" in the NFPA 1 Fire Code Section A.3.3.98 contains the following statement: "The term explosive includes any material determined to be within the scope of Title 18, United States Code, Chapter 40, and also includes any material classified as an explosive, other than consumer fireworks, 1.4G, by the Hazardous Materials Regulations of the U.S. Department of Transportation in 49 CFR."

The proponent's Reason Statement also states that the following regulations, standards and codes do not contain language saying that consumer fireworks are not explosive:

DOTn 49 CFR: Parts 100 – 178
US CPSC 16 CFR, UN0336

NFPA 495 Explosives Materials Code (2006)
NFPA 1123 Code for Fireworks Display (2010)
NFPA 1126 Standard for the Use of Pyrotechnics Before a Proximate Audience (2006)

The following discusses why that is or is not the case.

The regulations in DOTn 49 CFR: Parts 100 – 178 establish the UN classification scheme for explosives as the basis of the DOTn regulations for the transportation of explosives in the United States. In that classification scheme consumer fireworks in the U.S. are classified as fireworks, 1.4G (UN0336) for the purposes of regulating these devices in transportation. The International Fire Code (IFC) has also utilized the UN classification scheme for explosives for regulating explosives in other uses and applications, as well as in transportation. Because of this, it was necessary to adapt the classification scheme for consumer fireworks, 1.4G for regulating those devices in other than transportation since they are truly not explosive within the context of the IFC requirements for explosives. Even the BATF exempts consumer fireworks from their Federal Explosives Law and Regulations (2007) which establish requirements for explosives. The BATF Federal Explosives Law and Regulations define consumer fireworks as follows: "Any small firework device designed to produce visible effects by combustion and which must comply with the construction, chemical composition, and labeling regulations of the U.S. Consumer Products Safety Commission, as set forth in Title 16, Code of Federal Regulations, Parts 1500 and 1507. Some small devices designed to produce audible effects are included, such as whistling devices, ground devices containing 50 mg or less of explosive materials, and aerial devices containing 130 mg or less of explosive materials. Consumer fireworks are classified as fireworks UN0336 and UN0337 by the U.S. Department of Transportation at 49 CFR 172.101. This term does not include fused setpieces containing components which together exceed 50 mg of salute powder."

The US CPC 16 CFR, UN0336 contains the regulations for the construction, chemical composition, and labeling of consumer fireworks (UN0336) which establish the basis for regulating consumer fireworks in the U.S. Therefore, those regulations are not concerned with the need to indicate that consumer fireworks are not considered explosives. They simply establish the criteria for what makes a pyrotechnic device a consumer fireworks regulated by the CPSC which are the only types of consumer fireworks allowed to be sold for use by consumers in the U.S.

NFPA 495 Explosive Materials Code (2006) does not contain such a statement since the application of that code does not apply to consumer fireworks. In fact, Section 1.3.4 states: "This code shall not apply to pyrotechnics such as flares, fuses, and railway torpedoes. It also shall not apply to fireworks and pyrotechnic special effects as defined in NFPA 1123, Code for Fireworks Display; NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Pyrotechnic Articles; and NFPA 1126 Standard for the Use of Pyrotechnics Before a Proximate Audience."

Similarly, the scope of NFPA 1123 Code for Fireworks Display (2010) in Section 1.1.2 states: "This code shall not apply to the following: (3) Use of consumer fireworks by the public." The same is true for NFPA 1126 Standard for the Use of Pyrotechnics Before a Proximate Audience (2006) which states in Section 1.38: "This standard shall not apply to the use of consumer fireworks by the general public."

In conclusion, it becomes readily apparent when the proper research is conducted in a thorough manner of all of the applicable codes, standards, and regulations for consumer fireworks, 1.4G that approving this code change as modified by the Committee would make the IFC inconsistent with all the previously noted regulations, standards, and codes. However, approving this code change as modified by the Committee as further modified by this Public Comment will maintain the IFC consistent with those regulations, standards, and codes regarding consumer fireworks, 1.4G. Therefore, we urge the Class A voting members to vote for Approval as Modified by this Public Comment to obtain the necessary two-thirds majority vote to approve this Public Comment.

Public Comment 2:

Rick Thornberry, PE, The Code Consortium, Inc. representing American Pyrotechnics Association (APA), requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

IBC [F] TABLE 414.5.1
EXPLOSION CONTROL REQUIREMENTS[a]

		EXPLOSION CONTROL METHODS	
MATERIAL	**CLASS**	**Barricade construction**	**Explosion (deflagration) venting or explosion (deflagration) prevention systems[b]**
HAZARD CATEGORY			
Combustible dusts[c]	–	Not Required	Required
Cryogenic flammables	–	Not Required	Required
Explosives	Division 1.1 Division 1.2 Division 1.3 Division 1.4[h] Division 1.5 Division 1.6	Required Required Not Required Not Required Required Required	Not Required Not Required Required Required Not Required Not Required
Flammable gas	Gaseous Liquefied	Not Required Not Required	Required Required
Flammable liquid	IA[d] IB[e]	Not Required Not Required	Required Required
Organic peroxides	U I	Required Required	Not Permitted Not Permitted
Oxidizer liquids and solids	4	Required	Not Permitted
Pyrophoric gas	–	Not Required	Required
Unstable (reactive)	4 3 Detonable 3 Nondetonable	Required Required Not Required	Not Permitted Not Permitted Required
Water-reactive liquids and solids	3	Not Required	Required

	2[g]	Not Required	Required
SPECIAL USES			
Acetylene generator rooms	–	Not Required	Required
Grain processing	–	Not Required	Required
Liquefied petroleum gas-distribution facilities	–	Not Required	Required
Where explosion hazards exist[f]	Detonation Deflagration	Required Not Required	Not Permitted Required

a. See Section 414.1.3.
b. See the International Fire Code.
c. As generated during manufacturing or processing. See definitions of "Combustible dust" in Chapter 3.
d. Storage or use.
e. In open use or dispensing.
f. Rooms containing dispensing and use of hazardous materials when an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.
g. A method of explosion control shall be provided when Class 2 water-reactive materials can form potentially explosive mixtures.
h. This table shall not apply to consumer fireworks, 1.4G.

IBC [F] 415.3.1 Group H occupancy minimum fire separation distance. Regardless of any other provisions, buildings containing Group H occupancies shall be set back to the minimum fire separation distance as set forth in Items 1 through 4 below. Distances shall be measured from the walls enclosing the occupancy to lot lines, including those on a public way. Distances to assumed lot lines established for the purpose of determining exterior wall and opening protection are not to be used to establish the minimum fire separation distance for buildings on sites where explosives are manufactured or used when separation is provided in accordance with the quantity distance tables specified for explosive materials in the International Fire Code.

1. Group H-1. Not less than 75 feet (22 860 mm) and not less than required by the International Fire Code.

   Exceptions:

   1. Fireworks manufacturing buildings separated in accordance with NFPA 1124.
   2. Buildings containing the following materials when separated in accordance with Table 415.3.1:
      2.1. Organic peroxides, unclassified detonable.
      2.2. Unstable reactive materials, Class 4.
      2.3. Unstable reactive materials, Class 3.
      2.4. Detonable pyrophoric materials.

2. Group H-2. Not less than 30 feet (9144 mm) where the area of the occupancy exceeds 1,000 square feet (93 m^2) and it is not required to be located in a detached building.
3. Groups H-2 and H-3. Not less than 50 feet (15 240 mm) where a detached building is required (See Table 415.3.2).
4. Groups H-2 and H-3. Occupancies containing materials with explosive characteristics shall be separated as required by the International Fire Code. Where separations are not specified, the distances required shall not be less than the distances required by Table 415.3.1.

   Exception: Consumer fireworks, 1.4G.

IBC [F] TABLE 415.3.2
DETACHED BUILDING REQUIRED

A DETACHED BUILDING IS REQUIRED WHEN THE QUANTITY OF MATERIAL EXCEEDS THAT LISTED HEREIN			
Material	**Class**	**Solids and Liquids (tons)[a, b]**	**Gases (cubic feet)[a, b]**
Explosives	Division 1.1 Division 1.2 Division 1.3 Division 1.4 Division 1.4[c] Division 1.5 Division 1.6	Maximum Allowable Quantity Maximum Allowable Quantity Maximum Allowable Quantity Maximum Allowable Quantity 1 Maximum Allowable Quantity Maximum Allowable Quantity	 Not Applicable
Oxidizers	Class 4	Maximum Allowable Quantity	Maximum Allowable Quantity
Unstable (reactives) detonable	Class 3 or 4	Maximum Allowable Quantity	Maximum Allowable Quantity
Oxidizer, liquids and solids	Class 3 Class 2	1,200 2,000	Not Applicable Not Applicable
Organic peroxides	Detonable Class I Class II Class III	Maximum Allowable Quantity Maximum Allowable Quantity 25 50	Not Applicable Not Applicable Not Applicable Not Applicable
Unstable (reactives) nondetonable	Class 3 Class 2	1 25	2,000 10,000
Water reactives	Class 3 Class 2	1 25	Not Applicable Not Applicable
Pyrophoric gases	Not Applicable	Not Applicable	2,000

For SI: 1 ton = 906 kg, 1 cubic foot = 0.02832 m^3, 1 pound = 0.454 kg.

a. For materials that are detonable, the distance to other buildings or lot lines shall be as specified in Table 415.3.1 based on trinitrotoluene (TNT) equivalence of the material. For materials classified as explosives, see Chapter 33 the International Fire Code. For all other materials, the distance shall be as indicated in Section 415.3.1.
b. "Maximum Allowable Quantity" means the maximum allowable quantity per control area set forth in Table 307.7(1).
c. Limited to Division 1.4 materials and articles, including articles packaged for shipment, that are not regulated as an explosive under Bureau of Alcohol, Tobacco and Firearms (BATF) regulations or unpackaged articles used in process operations that do not propagate a detonation or

deflagration between articles, providing the net explosive weight of individual articles does not exceed 1 pound. This table shall not apply to consumer fireworks, 1.4G.

(Portions of proposal not shown, remain unchanged.)

Commenter's Reason: This Public Comment proposes revisions to several sections of the International Building Code (IBC) that will end up regulating consumer fireworks, 1.4G if this Code Change F186-06/10 as modified by the Committee is approved. That is because consumer fireworks, 1.4G will be considered to be an explosive by the International Fire Code (IFC) due to the revisions made to the definitions for "Explosive" and "Fireworks, 1.4G" by Code Change F186-09/10. We have conducted an extensive evaluation and analysis of the requirements in the IBC and the IFC regulating explosives to determine those sections that would subsequently apply to consumer fireworks, 1.4G based on approval as modified of this Code Change. The result is that the following tables and section would be applicable to consumer fireworks, 1.4G, although they are not currently:

[F] Table 414.5.1 Explosion Control Requirements
[F] 415.3.1 Group H Occupancy Minimum Fire Separation Distance
[F] Table 415.3.2 Detached Building Required

The proponent's Reason Statement contains the following: "In reality, at the model code level, other than the deletion of language saying consumer fireworks are not explosive, the net effect of this change will be zero to what is taking place in the world of consumer fireworks manufacturing, storage, sales and use." In other words, the proponent is indicating that his code change should not change the application of the requirements of the IBC and the IFC for explosives regarding consumer fireworks, 1.4G. So we are proposing revisions to the above noted section and tables to implement that intent as follows.

We have proposed to add a new Footnote h to Table 414.5.1 to indicate that the entry for Explosives, Division 1.4 does not apply to consumer fireworks, 1.4G for explosion control requirements.

We have also proposed a revision to Item 4 of Section [F] 415.3.1 to add an Exception for consumer fireworks, 1.4G. This is necessary since this item specifies that Group H-3 occupancies (which consumer fireworks, 1.4G are classified as) are required to be separated in accordance with the IFC, but where those separations are not specified, the distances shall not be less than those distances required by Table 415.3.1 Minimum Separation Distances for Buildings Containing Explosive Materials. In reviewing the separation requirements in Chapter 33 of the IFC, consumer fireworks, 1.4G have been exempt from Table 3301.8.1(3) Application of Separation Distance (Q-D) Tables – Division 1.4 Explosives by Footnote d and Table 3304.5.2(3) Table of Distances (Q-D) For Buildings Containing Explosives – Division 1.4 by Footnote c. Therefore, the Exception we are proposing to Item 4 of Section 415.3.1 is needed so that the separation distances in Table 415.3.1 Minimum Separation Distances for Buildings Containing Explosive Materials are not applied to consumer fireworks, 1.4G.

And, finally, we have proposed a revision to Footnote c to Table 415.3.2 to indicate that the Table does not apply to consumer fireworks, 1.4G similar to the exemptions indicated above to the Tables in Chapter 33 of the IFC. In fact, Footnote c with the proposed revision is identical to Footnote c to Table 3304.5.2(3).

In conclusion, if the Class A voting members approve Code Change F186-09/10 as modified by the International Fire Code Committee, then the members should also vote to approve this Public Comment to further modify that Code Change to implement the intent of the original Code Change not to change the application of the explosive materials requirements of the IBC and IFC to consumer fireworks, 1.4G by simply changing the definition for "Explosive" and "Fireworks, 1.4G."

Final Action: AS AM AMPC____ D

F190-09/10
2703.8.3.2 (IBC [F] 414.2.2); 2702.1 (IBC [F] 307.2)

Proposed Change as Submitted

Proponent: Sarah A. Rice, CBO, representing self

Revise as follows:

2703.8.3.2 (IBC [F] 414.2.2) Percentage of maximum allowable quantities. The percentage of maximum allowable quantities of hazardous materials per *control area* allowed at each floor level within a building hall be in accordance with Table 2703.8.3.2. Where the quantity of hazardous material stored in the building is equal to or less than the maximum allowable quantity per control area in Tables 2703.1.1(1) and 2703.1.1(2), the entire building shall be considered a single control area and the maximum allowable quantity of hazardous material shall be permitted to be located anywhere in the building subject to the per-floor limitations of Table 2703.8.3.2.

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.

CONTROL AREA. A space or spaces within a building where quantities of hazardous materials not exceeding the maximum allowable quantities per control area are stored, dispensed, used or handled. A control area may be an entire building or a portion of a building. See also the definition of "Outdoor control area."

Reason: The intent of this proposal is to codify IFC Committee Interpretations #51-07 and #52-07. Interpretation #51-07 states that "When the quantity of hazardous material stored in the building is equal to or less than the maximum allowable quantity per control area in Tables 2703.1.1(1)

and 2703.1.1(2), the entire building would be considered the control area. When the entire building is the control area, the maximum allowable quantity of material may be located anywhere in the building subject to the per-floor limitations of Table 2703.8.3.2." Interpretation #52-07 states that "When the quantity of hazardous material being stored in each control area is equal to or less than the maximum allowable quantity per control area in Tables 2703.1.1(1) and 2703.1.1(2), the maximum allowable quantity of material per control area may be located anywhere within a multi-story control area, subject to the per-floor limitations of Table 2703.8.3.2."

This proposal revises Section 2703.8.3.2 to clarify that the provisions of Table 2703.8.3.2 are applicable to a multi-story building that is a single control area. The control area definition is also being revised to clarify that an entire building of any height or area can, in fact, be considered a control area

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

ICCFILENAME: RICE-G5-414~RENAMED-F1-2703.8.2

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee felt that the proposal, while consistent with the issued committee interpretations, does not clarify the code because the interpretations themselves are a problem. The code has always allowed multi-story control areas. The committee did feel, however, that the proposed revision to the definition of Control Area had merit and should be pursued in a public comment.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Sarah A. Rice, CBO, The Preview Group, representing self, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

2703.8.3.2 (IBC [F] 414.2.2) Percentage of maximum allowable quantities. The percentage of maximum allowable quantities of hazardous materials per *control area* allowed at each floor level within a building hall be in accordance with Table 2703.8.3.2. ~~Where the quantity of hazardous material stored in the building is equal to or less than the maximum allowable quantity per control area in Tables 2703.1.1(1) and 2703.1.1(2), the entire building shall be considered a single control area and the maximum allowable quantity of hazardous material shall be permitted to be located anywhere in the building subject to the per-floor limitations of Table 2703.8.3.2.~~

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.

CONTROL AREA. A space or spaces within a building where quantities of hazardous materials not exceeding the maximum allowable quantities per control area are stored, dispensed, used or handled. A control area may be an entire building or a portion of a building. See also the definition of "Outdoor control area."

Commenters Reason: The code change has been modified to reflect the comments received during the public hearings in Baltimore. The committee confirmed that there is NOT a consensus regarding the distribution of hazardous materials within a single control area, that language has been removed. The code change not only seeks to act on the committees' recommendation to modify the definition of "control area" by making it clear that a single building (regardless of the number of stories in the building) can be considered and regulated as a one (1) control area.

Final Action: AS AM AMPC____ D

F196-09/10

3301.1, 3301.1.3.1 (New), 3302.1, Chapter 47; IBC [F] 307.2, IBC Chapter 35

Proposed Change as Submitted

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing: American Pyrotechnics Association (APA)

1. Revise the IFC as follows:

3301.1 Scope. The provisions of this chapter shall govern the possession, manufacture, storage, handling, sale and use of explosives, explosive materials, fireworks and small arms ammunition.

Exceptions:

1. The Armed Forces of the United States, Coast Guard or National Guard.
2. Explosives in forms prescribed by the official United States Pharmacopoeia.
3. The possession, storage and use of small arms ammunition when packaged in accordance with DOTn packaging requirements.
4. The possession, storage and use of not more than 1 pound (0.454 kg) of commercially manufactured sporting black powder, 20 pounds (9 kg) of smokeless powder and 10,000 small arms primers for hand loading of small arms ammunition for personal consumption.
5. The use of explosive materials by federal, state and local regulatory, law enforcement and fire agencies acting in their official capacities.
6. Special industrial explosive devices which in the aggregate contain less than 50 pounds (23 kg) of explosive materials.
7. The possession, storage and use of blank industrial power load cartridges when packaged in accordance with DOTn packaging regulations.
8. Transportation in accordance with DOTn 49 CFR Part 100-185.
9. Items preempted by federal regulations.
10. Novelties.

3302.1 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.

EXPLOSIVE. A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, igniters and display fireworks, 1.3G (Class B, Special).

The term “Explosive” includes any material determined to be within the scope of USC Title 18: Chapter 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G (Class C, Common) and novelties, 1.4G by hazardous materials regulations of DOTn 49 CFR Parts 100-185.

2. Add new text to the IFC as follows:

3301.1.3.1 Novelties, 1.4G. Novelties, 1.4G shall be regulated as fireworks, 1.4G for the purpose of this code.

3302.1 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.

NOVELTIES. Small pyrotechnic devices not requiring DOTn approval and containing small amounts of pyrotechnic or explosive composition designed to produce limited visible or audible effects and not classified as consumer fireworks, 1.4G or novelties, 1.4G. Such novelties which comply with the labeling regulations of the US Consumer Product Safety Commission as set forth in CPSC 16 CFR: Parts 1500 and 1507 are not explosive materials for the purpose of this code.

NOVELTIES, 1.4G. Small pyrotechnic devices approved by DOTn and containing small amounts of pyrotechnic or explosive composition designed to produce limited visible or audible effects and not classified as consumer fireworks, 1.4G. Such 1.4G novelties which comply with the construction, chemical composition, and labeling regulations of American Pyrotechnics Association Standard 87-1 and the US Consumer Products Safety Commission as set forth in CPSC 16 CFR: Parts 1500 and 1507 are not explosive materials for the purpose of this code.

3. Revise the IBC as follows:

IBC [F] 307.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

EXPLOSIVE. A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, igniters and display fireworks, 1.3G (Class B, Special).

The term “Explosive” includes any material determined to be within the scope of USC Title 18: Chapter 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G (Class C, Common) and novelties, 1.4G by hazardous materials regulations of DOTn 49 CFR Parts 100-185.

4. Add new text to the IBC as follows:

IBC [F] 307.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

NOVELTIES, 1.4G. Small pyrotechnic devices approved by DOTn and containing small amounts of pyrotechnic or explosive composition designed to produce limited visible or audible effects and not classified as consumer fireworks, 1.4G. Such 1.4G novelties which comply with the construction, chemical composition, and labeling regulations of American Pyrotechnics Association Standard 87-1 and the US Consumer Products Safety Commission as set forth in CPSC 16 CFR: Parts 1500 and 1507 are not explosive materials and shall be regulated as fireworks, 1.4G for the purpose of this code.

5. Add new referenced standard to IFC Chapter 47 and IBC Chapter 35 as follows:

APA
American Pyrotechnics Association
Post Office Box 30438
Bethesda, MD 20824

87-1 (2001) Standard for Construction and Approval for Transportation of Fireworks, Novelties, and Theatrical Pyrotechnics

Reason: Items 1 and 2: The purpose of this proposed code change is to close a loophole in the current requirements in Chapter 33 that regulate consumer fireworks, 1.4G. There is another class of similar fireworks items with a lesser hazard that are classified as novelties, 1.4G. These items, in general, have less pyrotechnic and/or explosive composition than consumer fireworks, 1.4G so they are less of a fire and life safety hazard. However, they are still regulated by the DOTn and are also required to meet the labeling requirements of the CPSC for consumer fireworks, 1.4G. This information can be found in Section C.3.2 Novelty of American Pyrotechnics Association APA Standard 87-1 which is being proposed as a referenced standard. APA Standard 87-1 is titled “Standard for Construction and Approval for Transportation of Fireworks, Novelties, and Theatrical Pyrotechnics.” APA Standard 87-1 comprises Annex C of NFPA 1124-2006, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnics Articles. It is also referenced by the DOTn in Title 49, CFR, 171-180 and by the CPSC in Title 16, CFR, 1000 to End. It is available from both the federal government and the APA.

This code change proposal also clarifies that novelties which are not classed as novelties, 1.4G because they do not require DOTn approval and they are not regulated as explosives by the DOTn are exempt from the requirements of Chapter 33. However, they are still required to comply with the labeling regulations of the US Consumer Products Safety Commission as set forth in CPSC 16, CFR: Parts 1500 and 1507.

New definitions have also been provided for “Novelties” and “Novelties, 1.4G” in order to help implement this code change proposal.

The proposed new definition for “Novelties” is necessary so the term can be referenced in this code change proposal in order to specifically exempt “novelties” from the requirements of Chapter 33. This will make the International Fire Code consistent with the DOTn regulations which do not require approval of novelties meeting the specific requirements of Section C.3.2 of APA Standard 87-1. In fact, such novelties are not regulated by the DOTn as explosives, although they are still required to comply with CPSC labeling requirements for consumer fireworks. Such “novelties” contain very small amounts of pyrotechnic and/or explosive compositions which for transportation purposes are not considered to be a fire or explosion hazard in their manufactured form.

The proposed new definition for “Novelties, 1.4G” is based on the definition contained in Section C.2.12 Novelty of the American Pyrotechnics Association APA Standard 87-1.

Items 3 and 4: The purpose of this proposed code change is to close a loophole in the current requirements that regulate consumer fireworks, 1.4G. There is another class of similar fireworks items with a lesser hazard that are classified as novelties, 1.4G. These items, in general, have less pyrotechnic and/or explosive composition than consumer fireworks, 1.4G so they are less of a fire and life safety hazard. However, they are still regulated by the DOTn and are also required to meet the labeling requirements of the CPSC for consumer fireworks, 1.4G.

A new definition has also been provided for “Novelties, 1.4G” in order to help implement this code change proposal. This proposed new definition for “Novelties, 1.4G” is based on the definition contained in Section C.2.12 Novelty of the American Pyrotechnics Association APA Standard 87-1, Standard for Construction and Approval for Transportation of Fireworks, Novelties, and Theatrical Pyrotechnics which is being proposed as a referenced standard. APA Standard 87-1 comprises Annex C of NFPA 1124-2006, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnics Articles. It is also referenced by the DOTn in Title 49, CFR, 171-180 and by the CPSC in Title 16, CFR, 1000 to End. It is available from both the federal government and the APA. Additional information can also be found in Section C.3.2 Novelty of APA Standard 87-1.

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

Analysis: A review of the standard(s) proposed for inclusion in the code, APA 87-1 (2001), for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: THORNBERRY-F1-3301 COMBINED W-G3-307.2

Public Hearing Results

Note: The following analysis was not in the Code Change monograph but was published on the ICC website at http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf :

Analysis: Review of the proposed new standard APA 87-1 (2001) indicated that, in the opinion of ICC staff, the standard did not comply with ICC standards criteria, Sections 3.6.2.1, 3.6.2.11 and 3.6.3.2.

Committee Action: **Disapproved**

Committee Reason: The committee felt that the proposal is inconsistent with the action taken on code change F186-09/10 and that a modification suggested by the proponent to resolve that inconsistency was more confusing than helpful. Also, the proposed referenced standard does not comply with ICC CP-28, Section 3.6 and was also found to be unclear and confusing by some committee members.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Rick Thornberry, PE , The Code Consortium Inc, representing American Pyrotechnics Association (APA), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

3301.1 Scope. The provisions of this chapter shall govern the possession, manufacture, storage, handling, sale and use of explosives, explosive materials, fireworks and small arms ammunition.

Exceptions:

1 through 9 *(No change to text)*
~~10.~~ ~~Novelties.~~

3301.1.3.1 Novelties, 1.4G. Novelties, 1.4G shall be regulated as consumer fireworks, 1.4G for the purpose of this code

3302.1 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.

EXPLOSIVE. A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, igniters and display fireworks, 1.3G (Class B, Special).

The term "Explosive" includes any material determined to be within the scope of USC Title 18: Chapter 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G (Class C, Common) ~~and novelties, 1.4G~~ by hazardous materials regulations of DOTn 49 CFR Parts 100-185.

~~**NOVELTIES.** Small pyrotechnic devices not requiring DOTn approval and containing small amounts of pyrotechnic or explosive composition designed to produce limited visible or audible effects and not classified as consumer fireworks, 1.4G or novelties, 1.4G. Such novelties which comply with the labeling regulations of the US Consumer Product Safety Commission as set forth in CPSC 16 CFR: Parts 1500 and 1507 are not explosive materials for the purpose of this code.~~

NOVELTIES, 1.4G. Small pyrotechnic devices approved by DOTn and containing small amounts of pyrotechnic or explosive composition designed to produce limited visible or audible effects and not classified as consumer fireworks, 1.4G. Such 1.4G novelties which comply with the construction, chemical composition, and labeling regulations of ~~American Pyrotechnics Association Standard 87-1 and~~ the US Consumer Products Safety Commission as set forth in CPSC 16 CFR: Parts 1500 and 1507 and the standard referenced in DOTn 49 CFR: Part 173.56(j)(1) are not explosive materials for the purpose of this code.

IBC [F] 307.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

EXPLOSIVE. A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, igniters and display fireworks, 1.3G (Class B, Special).

The term "Explosive" includes any material determined to be within the scope of USC Title 18: Chapter 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G (Class C, Common) ~~and novelties, 1.4G~~ by hazardous materials regulations of DOTn 49 CFR Parts 100-185.

~~**NOVELTIES, 1.4G.** Small pyrotechnic devices approved by DOTn and containing small amounts of pyrotechnic or explosive composition designed to produce limited visible or audible effects and not classified as consumer fireworks, 1.4G. Such 1.4G novelties which comply with the construction, chemical composition, and labeling regulations of American Pyrotechnics Association Standard 87-1 and the US Consumer Products Safety Commission as set forth in CPSC 16 CFR: Parts 1500 and 1507 are not explosive materials for the purpose of this code.~~

~~American Pyrotechnics Association~~
~~**APA** Post Office Box 30438~~
~~Bethesda, MD 20824~~
~~APA 87-1 (2001) Standard for Construction and Approval for Transportation of Fireworks, Novelties, and Theatrical Pyrotechnics~~

Commenter's Reason: This Public Comment contains revisions that respond to the Committee Reason Statement indicating why the International Fire Code Development Committee voted for disapproval of this Code Change Proposal. First, the Committee felt that this Code Change Proposal was inconsistent with the action they took on F186-09/10 for approval as modified. We have addressed that concern by deleting the proposed new definition for "Novelties" in both the International Building Code (IBC) and the International Fire Code (IFC). We have also deleted novelties from the Exceptions to Section 3301.1 Scope of the IFC. And we have deleted the reference to novelties, 1.4G in the second paragraph of the definition for "Explosive." Although the second paragraph was recommended for deletion in Code Change F186-09/10, we have proposed the deletion of the reference to novelties, 1.4G just in case F186-09/10 is disapproved or further revised during the ICC Final Action Hearings.

The Committee also expressed its concern about the reference to the American Pyrotechnics Association Standard 87-1 contained in the proposed new definition for "novelties, 1.4G" since it did not comply with the ICC standards criteria for consensus standards and it was also found to be unclear and confusing by some Committee members. So we deleted the reference to the standard and substituted a reference to DOTn 49 CFR: Part 173.56(J)(1) which provides the necessary reference for the DOTn regulations defining novelties which also include their construction, chemical composition, and labeling regulations.

As a result of the revisions contained in this Public Comment, novelties, 1.4G will be regulated the same as consumer fireworks, 1.4G are currently regulated in both the IBC and the IFC. This will close an unintended loophole in these codes which is currently the result of the DOTn differentiating between novelties, 1.4G and consumer fireworks, 1.4G for the purposes of regulating these devices in transportation. This will make the IBC and the IFC consistent with DOTn regulations for these pyrotechnic devices.

Analysis: The standard referenced by DOTn 49 CFR Part 173.56 (j)(l) in IFC Section 3302.1 in the proposed revision to the definition of Novelties, 1.4G, is American Pyrotechnics Association (APA) Standard 87-1 (2001).

Final Action: AS AM AMPC____ D

F203-09/10
3404.2.7.3.2, 3404.2.9.7.3

Proposed Change as Submitted

Proponent: Steve M. Crothers, Seattle Fire Department, representing Washington State Association of Fire Marshals

Revise as follows:

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 that remain closed unless venting under pressure or vacuum conditions shall be installed in normal vents of tanks containing Class IB and IC liquids.

Exception: When determined by the fire code official that the use of such devices can result in damage to the tank.

Vent-line flame arresters and venting devices shall be installed and maintained in accordance with their listings and API 2000. ~~Use of~~ In-line flame arresters in piping systems shall be installed and maintained in accordance with their listing and API 2028. Pressure vacuum vents shall be installed and maintained in accordance with API 2000.

2. Delete without substitution:

~~**3404.2.9.7.3 Flame arresters.** Approved flame arresters or pressure breather valves shall be installed in normal vents.~~

(Renumber subsequent sections)

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 cannot 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 corrosion can present obstructions in flame arresters that may justify omitting the device.
5. Clarifies that the existing API reference document (API 2028) addresses in-line flame arresters for piping systems. 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. Both are approved devices.
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 2000.

Cost Impact: Costs will decrease since currently any aboveground tank containing Class I, II or III liquids requires a flame arrestor on the normal vent and this proposal will require flame arrestors only on Class I liquid tanks. There could be some cost increase where maintenance of flame arrestors does not currently occur.

ICCFILENAME: CROTHERS-F2-3404.2.9.7.3.DOC

Public Hearing Results

Committee Action: **Approved as Modified**

Modify the proposal as follows:

3404.2.7.3.2 Vent-line flame arresters pressure-vacuum vents. Listed or approved flame arresters or pressure-vacuum (PV) vents that remain closed unless venting under pressure or vacuum conditions shall be installed in normal vents of tanks containing Class IB and IC liquids.

Exception: When determined by the fire code official that the use of such devices can result in damage to the tank.

Vent-line flame arresters ~~and venting devices~~ shall be installed ~~and maintained~~ in accordance with their listings ~~and~~ or API 2000 and maintained in accordance with Section 21.8.6 of NFPA 30 or API 2000. ~~Use of~~ In-line flame arresters in piping systems shall be installed and maintained in accordance with their listing ~~and~~ or API 2028. Pressure vacuum vents shall be installed in accordance with Section 21.4.3 of NFPA 30 or API 2000 and maintained in accordance with Section 21.8.6 of NFPA 30 or API 2000.

3404.2.9.7.3 Flame arresters. Approved flame arresters or pressure breather valves shall be installed in normal vents.

Committee Reason: The committee agreed that the proposal provides a needed improvement in the level of protection afforded to aboveground tanks that are not classified as protected aboveground tanks. The modification to Section 3404.2.7.3.2 adds a reference to the appropriate NFPA 30 section as an alternative to API 2000. The modification to reinstate Section 3404.2.9.7.3 maintains the extra measure of protection that has always been afforded to protected aboveground tanks.

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, Seattle Fire Department, representing Washington State Association of Fire Marshal's, requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

3404.2.7.3.2 Vent-line flame arresters and pressure-vacuum vents. Listed or approved flame arresters or pressure-vacuum (PV) vents that remain closed unless venting under pressure or vacuum conditions shall be installed in normal vents of tanks containing Class IB and IC liquids.

Exception: When ~~determined by the fire code official that the~~ use of such devices can result in damage to the tank due to the liquid properties, including but not limited to, condensation, crystallization, corrosiveness, freezing, polymerization, or plugging.

Vent-line flame arresters shall be installed in accordance with their listings or API 2000 and maintained in accordance with Section 21.8.6 of NFPA 30 or API 2000. Inline flame arresters in piping systems shall be installed and maintained in accordance with their listing or API 2028. Pressure-vacuum vents shall be installed in accordance with Section 21.4.3 of NFPA 30 or API 2000 and maintained in accordance with Section 21.8.6 of NFPA 30 or API 2000.

~~**3404.2.9.7.3 Flame arresters.** Approved flame arresters or pressure breather valves shall be installed in normal vents.~~

Commenter's Reason: The exception is revised in response to a Committee comment to eliminate the fire code official's responsibility to 'determine' when the tank can be damaged. This revision also adds more information to assist the code user in determining when omitting the device is justified.

The intent of the original code change proposal was to require flame arresters and pressure breather valves on aboveground tanks when the liquid in the tank presented the hazard that the device is intended to control. That was accomplished by the Committee action taken in Section 3404.2.7.3.2, which limits the requirement for flame arresters and pressure breather valves to tanks (UL142-steel aboveground tanks or UL2085-protected aboveground tanks) containing Class IB and IC liquids.

Section 3404.2.9.7 sets forth additional requirements for UL2085 protected aboveground tanks, and if Section 3404.2.9.7.3 is retained, it will require flame arresters or pressure breather valves to be installed on all aboveground protected tanks (UL2085), regardless of the fuel contained, including tanks containing Class II and Class III combustible liquids. Retaining 3404.2.9.7.3 simply adds a control that is not necessary and sets up an unwarranted disparity between the requirements for steel aboveground tanks (UL142) and aboveground protected tanks (UL2085).

This proposed change is consistent with 2008 NFPA 30 Section 21.4.3.9 and its Annex note:

"21.4.3.6 Tanks and vessels that store Class IA liquids shall be equipped with venting devices that are closed, except when venting under pressure or vacuum conditions.

21.4.3.7 Tanks and pressure vessels that store Class IB and Class IC liquids shall be equipped with venting devices or with listed flame arresters. When used, vent devices shall be closed, except when venting under pressure or vacuum conditions.

21.4.3.9 Flame arresters or venting devices required in 21.4.3.6 and 21.4.3.7 shall be permitted to be omitted on tanks that store Class IB or Class IC liquids where conditions are such that their use can, in case of obstruction, result in damage to the tank.*

Annex Note A.21.4.3.9 Liquid properties that justify omitting such devices include, but are not limited to, condensation, corrosiveness, crystallization, polymerization, freezing, or plugging. When any of these conditions exist, consideration should be given to heating, use of devices that employ special materials of construction, use of liquid seals, or inerting. See NFPA 69, Standard on Explosion Prevention Systems."

Final Action: AS AM AMPC____ D

F204-09/10
3404.2.7.4

Proposed Change as Submitted

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

Revise as follows:

3404.2.7.4 Emergency venting. Stationary, aboveground tanks shall be equipped with additional venting that will relieve excessive internal pressure caused by exposure to fires. Emergency vents for Class I, II and IIIA liquids shall not discharge inside buildings. The venting shall be installed and maintained in accordance with Section 22.7 of NFPA 30.

Exceptions:

1. Tanks larger than 12,000 gallons (45 420 L) in capacity storing Class IIIB liquids which are not within the diked area or the drainage path of Class I or II liquids do not require emergency relief venting.
2. Emergency vents on protected aboveground tanks complying with UL 2085 containing Class II or IIIA liquids are allowed to discharge inside the building.

Reason: UL 2085 protected aboveground tanks are designed and constructed to withstand a two-hour fire test of 2000°F during which no single point temperature may exceed 400°F and the average temperature rise throughout the internal tank can be no greater than 260°F. The largest quantity of Class II or IIIA liquid that can be stored indoors in a UL 2085 tank unprotected by an approved automatic sprinkler system is 660 gallons. Given the stringent testing requirement, and the required sprinkler coverage, activation of the emergency vent is likely only under extreme fire conditions over an extended period of time. Further, NFPA 30 requires that emergency vents placed on vent pipes that extend beyond twelve inches from the tank be reengineered to account for the potential back pressure and ensure activation at the appropriate pressure. It is not unusual to see vent lines extending 30 or 40 feet or more through a building in order to achieve the exterior discharge. Allowing the emergency vent to discharge inside eliminates the need to reengineer the venting and ensures proper sizing and activation of the emergency vent.

Cost Impact: There is a cost savings since emergency vent lines would not be required to extend through buildings to the exterior.

ICCFILENAME: KILPATRICK-F4-3404.2.7.4.DOC

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's reason statement that the proposal will provide increased safety for protected aboveground tanks installed indoors and storing Class I liquids.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Rick Thornberry, PE, The Code Consortium Inc, representing ConVault, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

3404.2.7.4 Emergency venting. Stationary, aboveground tanks shall be equipped with additional venting that will relieve excessive internal pressure caused by exposure to fires. Emergency vents for Class I, II, and IIIA liquids shall not discharge inside buildings. The venting shall be installed and maintained in accordance with Section 22.7 of NFPA 30.

Exceptions:

1. Tanks larger than 12,000 gallons (45 420 L) in capacity storing Class IIIB liquids which are not within the diked area or the drainage path of Class I or II liquids do not require emergency relief venting.
2. Emergency vents on protected aboveground tanks complying with UL 2085 containing Class ~~II or~~ IIIA liquids are allowed to discharge inside the building.

Commenter's Reason: The purpose of this Public Comment is to limit the application of the proposed new Exception 2 to Section 3404.2.7.4 Emergency Venting so that it only allows the emergency vent on protected aboveground tanks to discharge inside the building where Class IIIA liquids are stored in the tanks. We believe that such an exception will not unduly compromise the very excellent safety record that protected aboveground tanks have displayed in the field and will maintain the level of fire and life safety intended by such tanks when they were originally developed and incorporated into the requirements of the legacy model fire codes.

We expressed our concerns in public testimony to the International Fire Code Committee during the hearings in Baltimore that we were basically opposed to any exception to the emergency venting requirements for protected aboveground tanks that would reduce the level of safety. But we felt reasonably comfortable if Class IIIA liquids were allowed to be vented inside the building. Our main concern is that Class II liquids have a flash point as low as 100°F and it could be possible to have vapors generated during a significant fire exposure released into the fire area via the emergency vent, even though there are very severe limitations on the temperature rise allowed for the contents of a protected aboveground tank when exposed to a 2-hour flammable liquid pool fire. The original concept of the protected aboveground tank was that it was intended to provide comparable safety to an underground storage tank. Thus, a very conservative approach was taken to the requirements in the fire codes to allow protected aboveground tanks in situations where they had been previously prohibited since only underground tanks were allowed. Therefore, we believe there is a need to continue to be cautious when looking at the possibility of relaxing any of the requirements currently contained in the IFC for protected aboveground tanks.

In conclusion, we would request that the Class A voting members either approve this Public Comment amending Code Change F204-09/10 to eliminate Class II liquids from Exception 2 to Section 3404.2.7.4 or disapprove this code change proposal altogether.

Final Action: AS AM AMPC____ D

F211-09/10
3405.3.6.1, Chapter 47

Proposed Change as Submitted

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

3405.3.6.1 Cleaning operations. Class IA liquids shall not be used for cleaning. Cleaning with Class IB, IC or II liquids shall be conducted as follows:

1. In a room or building in accordance with Section 3405.3.7; or
2. In a parts cleaner ~~machine~~ listed and labeled in accordance with UL 1204 and approved for the purpose in accordance with Section 3405.3.6.2.

Exception: Materials used in commercial and industrial process-related cleaning operations in accordance with other provisions of this code and not involving facilities maintenance cleaning operations.

2. Add new standard to Chapter 47 as follows:

UL
1204-04 Outline of Investigation for Parts Cleaners

Reason: UL's Subject 1204 Outline of Investigation includes a comprehensive set of construction and performance requirements that are used to evaluate and list parts cleaners. This equipment is reviewed to ensure the use and operation of the equipment provides a safe involvement using the flammable and combustible solvents. Five companies currently have parts cleaners listed.

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

Analysis: A review of the standard(s) proposed for inclusion in the code, UL 1204-04, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing Results

Note: The following analysis was not in the Code Change monograph but was published on the ICC website at http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf :

Analysis: Review of the proposed new standard UL 1204-04 indicated that, in the opinion of ICC staff, the standard did not comply with ICC standards criteria, Sections 3.6.2.11 and 3.6.3.2.

Committee Action: **Approved as Submitted**
Committee Reason: The committee agreed with the proponent's reason statement and felt that the proposal provided clearer guidance on the standard to which the machines must be listed.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Jonathan Humble (Chairman) representing ICC Reference Standards Committee requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

3405.3.6.1 Cleaning operations. Class IA liquids shall not be used for cleaning. Cleaning with Class IB, IC or II liquids shall be conducted as follows:

1. In a room or building in accordance with Section 3405.3.7; or
2. In a parts cleaner listed, ~~and~~ labeled ~~in accordance with UL 1204~~ and approved for the purpose in accordance with Section 3405.3.6.2.

   Exception: Materials used in commercial and industrial process-related cleaning operations in accordance with other provisions of this code and not involving facilities maintenance cleaning operations.

UL
~~1204-04 Outline of Investigation for Parts Cleaners~~

Commenter's Reason: The ICC Reference Standards Committee is a committee that was organized "to support the codes development committees through the review of reference standards for the International Codes." We submit this code challenge to provide an opinion regarding code change.

It is the reference standards committee's view that the proposal currently lacks sufficient information concerning the promulgation process. We would preface this opinion that it is not our view to state that the proposed document is technically deficient or that the proposal does not have technical merit, but rather to state that the document development process and maintenance process do not comply with ICC Council Policy 28, specifically Section 3.6.3, which requires standards be promulgated according to a consensus process.

We therefore propose to have deleted the reference standard and subsequent reference to that standard as part of this proposal to modify the original proposal.

Final Action: AS AM AMPC____ D

F216-09/10
3804.3.1 (New)

Proposed Change as Submitted

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

Add new text as follows:

3804.3.1 Installation on roof prohibited. The installation of LP-gas containers on the roofs of buildings is prohibited.

(Renumber subsequent sections)

Reason: Currently, Chapter 38 also refers to NFPA 58. NFPA 58 will allow the installation of LP-gas containers on rooftops. This proposal will include a specific restriction which will supersede the provisions in the referenced standard NFPA 58. As a result, propane tank installation will not be permitted on roof tops.

LP-gas is a flammable gas with a vapor density heavier than air. The heavier vapor density means that any leak from a roof mounted propane storage tank will travel down into the occupied spaces of the building where there is a very high probability of fire or explosion due to all the potential ignition sources.

Additionally, a building fire beneath the LP-gas container will impinge upon or heat the tank causing activation of the pressure relief valve. When the pressure relief valve is activated, it will release propane, which still is heavier than air, and the propane will travel downwards toward the fire and increase fire intensity. This could endanger the building or neighboring buildings and exposures.

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

ICCFILENAME: LARIVIERE-F20-3804.3.1.DOC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee felt that the proposal was taking too broad an approach with a total prohibition of LPG containers on roofs and felt that the code should not override the referenced standard, NFPA 58, which allows containers on roofs under certain conditions. The committee suggested that a container size limitation might be useful and also that the proposal should clarify that it would be applicable only to permanent installations and not to DOTn cylinders used in roofing operations.

Assembly Action: **Approved as Submitted**

Individual Consideration Agenda

This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action and public comments were submitted. Note that the assembly action, Approved as Submitted, will be the initial motion on the floor for consideration when this item is called.

Public Comment 1:

Joe Pierce (Chairman), Dallas Fire Department, representing Joint Fire Service Review Committee, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

3804.3.1 Installation on roof prohibited. ~~The installation of~~ Stationary LP-gas containers shall not be installed on the roofs of buildings ~~is prohibited~~.

(Renumber subsequent sections…)

Commenter's Reason: This code change was Approved as Submitted, but there were some comments at the Code Development Hearing that have resulted in some refinement of the wording. Comments indicated that the wording was too broad, and also that the code could not override the standard.

This Public Comment has been reworded to narrow its application in two ways: 1) it states that is only applies to "stationary" containers, 2) it is clearer now that it applies to "installation". Therefore, it does not apply to the use of LP-gas containers for torch applied roofing, or brazing for example. This restriction only applies to the installation of a stationary container.

The second concern of the Code Development Committee was that this code requirement would be more restrictive than the standard. This concept is commonly done in the I-Codes and in fact Section 102.7 states in part: "Where differences occur between the provisions of this code and the referenced standards, the provisions of this code shall apply." The Assembly body has anticipated differences between the code's provisions and the standard's provisions, and accepts those differences, provided that the code takes precedence over the standard.

In fact the differences between the code and the standard are intentional, as it is with this code change. For example:

Section 903.3.1.1.1 contains a list of areas exempt from fire sprinkler installation; which is not consistent with NFPA 13.
Section 903.3.1.2.1 contains requirements for fire sprinkler installation on balconies and decks; which is not consistent with NFPA 13R.
Section 1208.2 contains requirements for installation of fire sprinklers in Type III-A or Type III-B dry cleaning systems; which is not consistent with NFPA 32.
Section 907.5.2.3 requires manual fire alarm boxes to be red; which is not mentioned in NFPA 72.

This code change intends to disallow the installation of LP-gas containers on rooftops. It is simply a fire safety issue based on physics. Any leak of LP-gas will expose the building because the vapors are heavier than air.

The Public Comment will help ensure that this section is not misinterpreted to include containers used for temporary applications on the roof.

Public Comment 2:

Bruce Swiecicki, representing National Propane Gas Association, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

3804.3.1 Installation on roof prohibited. ~~The installation of~~ LP-gas containers used in stationary installations shall not be located on the roofs of buildings ~~is prohibited~~.

Commenter's Reason: The term "stationary installation" is used in NFPA 58 and defined as follows: "An installation of LP-Gas containers, piping, and equipment for indefinite use at a particular location; an installation not normally expected to change in status, condition, or location." Inserting the word "stationary" will ensure that this section is not misinterpreted to include containers used for temporary applications such as sealing roofing materials or brazing operations.

Final Action: AS AM AMPC____ D

F220-09/10

4603.4.3, 4603.4.4, 4603.4.5 (All New)

Proposed Change as Submitted

Proponents: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Add new text as follows:

4603.4.3 Group F-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group F-1 occupancy used for the manufacture of upholstered furniture or mattresses.

4603.4.4 Group M. An automatic sprinkler system shall be provided throughout all buildings containing a Group M occupancy used for the display and sale of upholstered furniture or mattresses.

4603.4.5 Group S-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group S-1 occupancy used for the storage of upholstered furniture or mattresses.

Reason: This proposal adds retroactive requirements to install an automatic sprinkler system in buildings containing F-1, M and S-1 occupancies involving upholstered furniture and mattresses. The purpose is to build upon the change approved last cycle to require mercantile occupancies with any amount of upholstered furniture to be suppressed as requested by the upholstered furniture industry.

The recognized hazard by a fuel load consisting of upholstered furniture and mattresses has been as identified as requiring sprinkler protection in newly constructed buildings that would also be required to meet all other current requirements of the International Series of Codes. Most, if not all existing buildings do not meet the current requirements of the International Series of Codes. A building that existed prior to the current editions of the International Series Codes most likely has less protective features and the existence of the fuel load presented by upholstered furniture and mattress would then create a greater hazard and an increased need for automatic fire suppression.

Cost Impact: The code change proposal will increase the cost of existing occupancies containing these hazards.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee felt that the proposal would create a financial hardship in these difficult economic times for existing businesses, especially small retailers, and would affect all occupancies in mixed-use buildings that house these types of businesses. The proposal should also be correlated with the action taken on code change F69-09/10 which established a threshold for these occupancies when new to prevent a more restrictive requirement for existing buildings.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Marcelo M. Hirschler (GBH International), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

4603.4.3 Group F-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group F-1 occupancy used for the manufacture of upholstered furniture or mattresses if the Group F-1 fire area exceeds 12,000 square feet (1,115 m^2), and the area that is used for the manufacture of upholstered furniture or mattresses exceeds 2,500 square feet (232 m^2).

4603.4.4 Group M. An automatic sprinkler system shall be provided throughout all buildings containing a Group M occupancy used for the display and sale of upholstered furniture or mattresses if the Group M fire area exceeds 12,000 square feet (1,115 m^2), and the area that is used for the display and sale of upholstered furniture or mattresses exceeds 2,500 square feet (232 m^2).

4603.4.5 Group S-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group S-1 occupancy used for the storage of upholstered furniture or mattresses if the Group S-1 fire area exceeds 12,000 square feet (1,115 m^2), and the area that is used for the storage of upholstered furniture or mattresses exceeds 2,500 square feet (232 m^2).

Commenter's Reason: The technical committee was concerned that the proposal was not coordinated with the results of code change F69-09/10, which was approved. The revised code change language addresses that. The committee was also concerned that the proposal would have caused an undue burden on very small retailers and the revised language excludes them.

The language approved in code change F69 is as follows:

903.2.4 (IBC [F] 903.2.4) Group F-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group F-1 occupancy where one of the following conditions exists:
1. Where a Group F-1 fire area exceeds 12,000 square feet (1115 m^2);
2. Where a Group F-1 fire area is located more than three stories above grade plane; or
3. Where the combined area of all Group F-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).
4. Where a Group F-1 occupancy that is used for the manufacture of upholstered furniture or mattresses exceeds 2,500 square feet (232 m^2).

.

903.2.7 (IBC [F] 903.2.7) **Group M.** An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:
1. Where a Group M fire area exceeds 12,000 square feet (1115 m^2);
2. Where a Group M fire area is located more than three stories above grade plane; or
3. Where the combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2). ; or
4. Where a Group M occupancy that is used for the display and sale of upholstered furniture or mattresses exceeds 5,000 square feet (464 m^2).

903.2.9 (IBC [F] 903.2.9) Group S-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group S-1 occupancy where one of the following conditions exists:
1. A Group S-1 fire area exceeds 12,000 square feet (1115 m^2);
2. A Group S-1 fire area is located more than three stories above grade plane; or
3. The combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).
4. A Group S-1 fire area used for the storage of commercial trucks or buses where the fire area exceeds 5,000 square feet (464 m^2).
5. A Group S-1 occupancy that is used for the storage of upholstered furniture or mattresses exceeds 2,500 square feet (232 m^2).

Final Action: AS AM AMPC____ D

F224-09/10
4603.6.7

Proposed Change as Submitted

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

4603.6.7 Group R-4. ~~An automatic or~~ A manual fire alarm system that activates an occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-2 residential care/assisted living facilities in accordance with Section ~~907.2.10~~ 907.2.10.1.

Exceptions:

1. Where there are interconnected smoke alarms meeting the requirements of Section 907.2.11 and there is at least one manual fire alarm box per floor arranged to continuously sound the smoke alarms.
2. Other manually activated, continuously sounding alarms *approved* by the *fire code official*.

Reason: During the prior code change cycle the effort was made to clear up the confusion between whether the required system must be a manual or automatic fire alarm system. Consistently, the code changes noted that the required retrofit system must be a manual one. However, in a few instances the clarification was not addressed in a code change.

This proposal is an effort to finish up the clean-up which began with the prior code change cycles in rewriting the requirements for fire alarms in existing buildings.

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

ICCFILENAME: BOECKER-F11-4603.6.7.DOC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee felt that removing the requirement for automatic systems would be inappropriate. It was also noted that the title of the section indicates that it is applicable to Group R-4 but the text indicates Group R-2.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Joe Pierce (Chairman), Dallas Fire Department, representing Joint Fire Service Review Committee, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

4603.6.7 Group R-4. A manual fire alarm system that activates an occupant notification system in accordance with Section 907.6 shall be installed in existing Group ~~R-2~~ R-4 residential care/assisted living facilities in accordance with Section 907.2.10.1.

Exceptions:

1. Where there are interconnected smoke alarms meeting the requirements of Section 907.2.11 and there is at least one manual fire alarm box per floor arranged to continuously sound the smoke alarms.
2. Other manually activated, continuously sounding alarms *approved* by the *fire code official*.

Commenter's Reason: This proposal was Disapproved at the Code Development Hearing because of the confusion as to whether it applied to Group R-4 (as in the section title), or to Group R-2 (as in the text). This Public Comment clarifies that this code section applies to existing Group R-4 residential care/assisted living facilities.

During the prior code change cycle the effort was made to clear up the confusion between whether the required system must be a manual or automatic fire alarm system. Consistently, the code changes noted that the required retrofit system must be a manual one. However, in a few instances the clarification was not addressed in a code change.

This proposal is an effort to finish up the clean-up which began with the prior code change cycles in rewriting the requirements for fire alarms in existing buildings.

Analysis: Current Section 4603.6.7 reads “Group R-4” in both the title and the text.

Final Action: AS AM AMPC____ D

F225-09/10
4603.7.1

Proposed Change as Submitted

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

Revise as follows:

4603.7.1 Where required. Existing Group R occupancies and *dwellings* not classified as Group R occupancies, which are not already provided with single-station smoke alarms complying with requirements of the code that governed at the time of construction, shall be provided with single-station smoke alarms~~. Installation shall be~~ in accordance with Section 907.2.11, except as provided in Sections 4603.7.2 and 4603.7.3.

Reason: This proposal is intended as a clarification to assist in proper application of the existing text. The key phrase that determines exactly what is required in existing Group R occupancies is “Existing Group R occupancies…not already provided with single station smoke alarms...” Although this statement appears fairly straightforward in its intended application, it is occasionally misinterpreted, perhaps because the IFC Commentary on this issue is even more misleading than the code itself. To some, the text suggests that anytime smoke alarms are not already installed throughout a Group R occupancy, located as required for new construction in accordance with Section 907.2.10, additional alarms must be installed to protect any areas, such as bedrooms, that would require protection in new construction. However, I can state with great certainty that this was never the intended application of the code.

The IFC text originated in the UFC in 1995, and it was carried directly into the IFC during the drafting process. Thereby, the intent of this section was established by the original UFC provision. The provision in question resulted from a code change proposal submitted by the Minnesota State Fire Chiefs Association in 1995 (Proposal #21, 1007-95-1). The proposal was initially disapproved by the UFC Code Development Committee, but was approved at the final action hearing after initial objections were addressed by a public comment.

Part 4 of the public comment was further revised by a floor motion at the hearing, which was when the text “not already provided with single station smoke detectors” was added to the code. This text replaced other proposed text “…in accordance with the building code under which the building was constructed. Buildings that were not constructed under the requirements of a building code shall meet the minimum requirements of Section 1007.2.9.2,” which needed to be changed because it didn’t require buildings that were constructed under an old building code, prior to when smoke alarms were first required, to be retrofitted. By adding “not already provided with single station smoke detectors,” the intent was to retain a “grandfather” clause for existing buildings that were previously provided with smoke alarms, while adding a requirement to retrofit buildings that were not.

When the IFC was developed, it was drafted using a combination of NFPA 1 Fire Prevention Code, NFPA 101 Life Safety Code and the UFC. Documentation from the drafting committee’s work on the retroactive smoke alarm section show that the committee was given a choice of accepting either the NFPA 101 provisions (Sections 19-3.4 through 19.3.4.4.2) or the UFC provisions (Sections 1007.2.9.2 through 1007.2.9.2.4) for apartments. With respect to smoke alarms in sleeping rooms, the choice made no difference because neither code required smoke alarms to be retrofitted in these areas. In fact, NFPA 101 quite clearly maintains that approach today in Section 31.3.4.5.1.

In the end, the IFC adopted the UFC text, which included the “Existing Group R occupancies not already provided with single station smoke alarms...” text that remains today. Lacking any code change that would have revised the intended application of Section 4603.7.1, I am confident that the original intent of the code, to grandfather existing buildings that had smoke alarms installed prior to adoption of the IFC, remains the proper application of the code today. Accordingly, this proposal should be approved to remove the existing ambiguity.

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

ICCFILENAME: SHAPIRO-F1-4603.7.1.DOC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee felt that the proposal would allow for the avoidance altogether of installing smoke alarms for buildings originally built under a code that did not require them. For buildings that were not built under any construction code, this becomes a property maintenance issue that does not belong in the IFC. The proposed language could also be in conflict with state legislations that require retroactive smoke alarm installations.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Joe Pierce (Chairman), Dallas Fire Department, representing Joint Fire Service Review Committee and Jeffrey Shapiro, representing the National Multi Housing Council, request Approval as Modified by this Public Comment.

Replace the proposal as follows:

4603.7.1 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 907.2.11, except as provided in Sections 4603.7.2 and 4603.7.3.

Exceptions:

1. Where the code that was in effect at the time of construction required smoke alarms and smoke alarms complying with those requirements are already provided.
2. Where smoke alarms have been installed in occupancies and dwellings that were not required to have them at the time of construction, additional smoke alarms shall not be required provided that the existing smoke alarms comply with requirements that were in effect at the time of installation.
3. Where smoke detectors connected to a fire alarm system have been installed as a substitute for smoke alarms.

Commenter's Reason: This proposal was Disapproved at the Code Development Hearing because the Committee felt that it did not satisfactorily address structures that were built under a code that did not require smoke alarms. This Public Comment revises the wording and adds exceptions with the simple intent of clarifying how the code is intended to apply.

The text of this public comment restructures the requirement into a base provision with exceptions. The base provision mandates smoke alarm installation in all existing Group R and other dwellings. Then, three exceptions are provided to address possible scenarios where smoke alarms have already been installed into an R occupancy but do not meet the current code requirements, recognizing that the intent of the existing code requirement was to permit existing smoke alarms to continue if they meet the code that was in effect at the time they were made.

Exception 1 indicates that smoke alarms which have been installed and maintained in accordance with the applicable code at the time of construction can continue.

Exception 2 indicates that smoke alarms, which were not required by the code at the time of construction, but were later installed, can continue when they meet the requirements of the applicable code at the time of installation.

Exception 3 indicates that smoke detectors connected to a fire alarm system may be used in lieu of smoke alarms.

In summary, the target of this code section has always been placing smoke alarms into Group R occupancies and dwellings that do not have ANY smoke alarms. This section was not intended to require compliance with the current smoke alarm requirements if the building already has smoke alarms that meet requirements that were applicable when they were installed. The focus is not to have the owner replace or revise their smoke alarms any time the code requirements for new construction change.

Final Action: AS AM AMPC____ D

F226-09/10
4603.8 (New)

Proposed Change as Submitted

Proponent: A. Hal Key, P.E., Fire Department, Mesa, AZ

Add new text as follows:

4603.8 Existing fire alarm systems. When an existing fire alarm system becomes unserviceable due to non-availability of components or parts, that system shall be replaced in accordance with Section 907.2.

Reason: When a fire alarm system becomes unserviceable due to the age of the equipment, the entire system must be replaced to maintain the system in operation. In most cases, the type of system (addressable vs. analog) changes and these systems need to be installed to the latest edition of the adopted code. Where an existing system has not yet been upgraded to the latest ADA requirements, the owners of these systems are already required to upgrade the system annunciation.

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

ICCFILENAME: KEY-F2-4603.8.DOC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee felt that replacement of an entire unserviceable system may not always be necessary but would be required by this proposal which could create a hardship for building owners.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Joe Pierce (Chairman), Dallas Fire Department, representing Joint Fire Service Review Committee, requests Approval as Modified by this Public Comment.

Replace the proposal as follows:

~~4603.8~~ 907.9.2 ~~Existing~~ Unserviceable fire alarm systems. When ~~an existing~~ a fire alarm system, or a portion of a fire alarm system, becomes unserviceable due to nonavailability of components or parts, that system, or portion thereof, shall be made serviceable or replaced ~~in accordance with Section 907.2~~.

(Renumber subsequent sections

Commenter's Reason: This proposal was Disapproved at the Code Development Hearing because the Committee felt that it was not clear on what specific items needed to be replaced.

There are times when a Fire Alarm Control Panel needs to be replaced because parts are no longer available, but the existing wiring throughout the building is intact and usable. In this case, the FACP would be replaced and the remainder of the system would remain. This will allow systems to be maintained in a working manner without complete removal and replacement of the entire fire alarm system.

The reference to Section 907.2 is deleted to eliminate the potential confusion that this requirement necessitates replacing the entire system, and needed to comply with current regulations. The intent of this section is to replace the components necessary to maintain the fire alarm system in an operational condition.

Additionally, this section is placed into Section 907.9 which deals with maintenance. Even though this section deals with existing buildings, it is more specific to maintenance of fire alarm systems which are regulated in Section 907. Therefore, Section 907.9.2 is a more appropriate location for this item, rather than Chapter 46.

Final Action: AS AM AMPC____ D

F229-09/10
Chapter 46, 102.1

Proposed Change as Submitted

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

1. Revise by relocating Chapter 46 in its entirety as follows:

~~CHAPTER 46~~ APPENDIX K
CONSTRUCTION REQUIREMENTS FOR EXISTING BUILDINGS

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 required in Chapter 46.~~
4. ~~4.~~3. Existing structures, facilities and conditions which, in the opinion of the *fire code official*, constitute a distinct hazard to life or property.

Reason: Many jurisdictions that adopt a model fire code lack the authority to retroactively mandate construction upgrades to existing buildings without some specific 'triggering' event. Additionally, as written, the triggering language in Chapter 46 is vague, and would lead to a lack of consistency in enforcement. Section 4601.4 states "Where a building is found to be in noncompliance, the fire code official shall duly notify the owner of the building." What is the mechanism for the fire code official to 'find' the building in noncompliance? Without some specific mechanism in the code, this will lead to arbitrary application of these retroactive requirements.

By relocating Chapter 46 to an appendix Chapter, those jurisdictions that have the authority, the mechanism, and the desire to require assessment and retrofit of existing buildings will have a framework on which they can build a comprehensive package. By removing the Chapter from the body of the code, the majority of jurisdictions, who are either unauthorized or unable to assess every existing building and mandate every possible retrofit outlined in the chapter, will not need to amend these provisions out of the code, or ignore the potential impact that the breadth of this Chapter would have on some older existing buildings. Note that even with the deletion of this Chapter from the body of the code, the fire code official still has the authority to mandate that 'distinct hazards to life and property' be mitigated.

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

ICCFILENAME: PERRY-F1-CHAP46.DOC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee felt that Chapter 46 should remain intact within the body of the code. Moving it to an appendix would require removal of the many "pointer" sections within the code that now direct the user to Chapter 46 because the code style does not allow directing the user to optional appendices since they are not part of the code. The committee also expressed its desire that Chapter 46, which is new to the 2009 edition of the IFC, be allowed to develop some use history before being substantially changed. The committee also observed that jurisdictions that adopt the code always have the authority to make amendments to it in their adopting ordinance and can just as easily amend out Chapter 46 if so desired.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Lawrence G. Perry, AIA, representing Building Owners and Managers Association (BOMA) International, requesting Approval as Modified by this Public Comment.

Modify the proposal as follows:

APPENDIX K
CONSTRUCTION REQUIREMENTS FOR EXISTING BUILDINGS

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 which, in the opinion of the *fire code official*, constitute a distinct hazard to life or property.

607.1 Emergency operation. ~~Existing elevators with a travel distance of 25 feet (7620 mm) or more 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.

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 required in Chapter 46.~~ New floor openings in existing buildings shall comply with the *International Building Code*.

~~**903.6 Existing buildings.** The provisions of this section are intended to provide a reasonable degree of safety in existing structures not complying with the minimum requirements of the *International Building Code* by requiring installation of an automatic fire-extinguishing system.~~

~~**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 where required in Chapter 46.~~

~~**903.6.2 Group I-2.** An *automatic sprinkler system* shall be provided throughout Group I-2 *fire areas* where required in Chapter 46.~~

~~**905.11 Existing buildings.** Where required in Chapter 46, existing structures shall be equipped with standpipes installed in accordance with Section 905.~~

~~**907.3 Where required in existing buildings and structures.** An *approved* fire alarm system shall be installed in existing buildings and structures where required in Chapter 46.~~

2506.1 Required access. New tire storage yards shall be provided with fire apparatus access roads in accordance with Section 503 and Section 2506.2. ~~Existing tire storage yards shall be provided with fire apparatus access roads where required in Chapter 46.~~

Commenter's Reason: This code change should be Approved as Modified for the following reasons:

1. There is likely not a single jurisdiction that uses the *International Fire Code* that retroactively applies all of the requirements of Chapter 46 to all existing buildings in the jurisdiction.
2. Selective application of portions of Chapter 46, or application only to certain buildings in a jurisdiction, exposes the jurisdiction to accusations of applying the code in an arbitrary and capricious manner.
3. One of the opponents of this change testified in Baltimore, Chapter 46 'sets a baseline for discussion' about existing buildings. Code requirements should not be 'baselines for discussion'.
4. If the intent of the IFC is that every existing building in a jurisdiction be brought up to the 'baseline' of Chapter 46, the provisions of Chapter 46 need to be clearly spelled out as to when they must be satisfied.
5. This comment proposes to delete the handful of 'pointers' to chapter 46 that are scattered in other parts of the IFC, which were pointed out during testimony in Baltimore. Deleting these 'pointers' would have no effect on jurisdictions that choose to adopt Chapter 46.

Final Action: AS AM AMPC____ D

F235-09/10
Appendix K (New)

Proposed Change as Submitted

Proponent: Michael Jacoby, Seven Valleys, PA, representing self

Add new text as follows:

APPENDIX K
EMERGENCY COMMUNICATION SYSTEMS
(HAZARDOUS SUBSTANCE)

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION K101
GENERAL

K101.1 Scope. This appendix contains provisions that are available for adoption by governments, communities or tribes who will have an opportunity to use the National Fire Protection Association's (NFPA) NFPA 72 codes that just added three new chapters at the same time made a name change to the National Fire Alarm and Signaling Codes that also includes the requirements for mass notification systems that can be found in a new chapter called Emergency Communication System (ECS) in NFPA 72-2010.

By adopting the provisions within this appendix it will give governments, communities or tribes etc. who already adopted the International Code Council (ICC) Codes, the ability to enhance their emergency communication by bringing these two major code organizations together to ensure that NFPA 72/National Fire Alarm and Signaling Codes, Emergency Communication Systems (ECS) such as in one-way, two-way and mass notification systems etc. are being designed and later installed per code as desired.

These requirements/codes/specifications could then be used in such applications as for college campuses, schools, and stadiums, community centers to include even local community warning/notification systems etc. when these emergency communication systems are being upgraded or initially installed thus providing early warning messages before, during or after manmade disasters/situations/events, natural disasters such as hurricanes, tornadoes, snowstorms, blizzards, flooding, massive fires while giving instructions to the public in times of crisis etc.

This appendix will also address system upgrades or the initial requirements for fixed sites/facilities with hazardous substances.

K101.2 Emergency communication system requirements. Fire alarm system upgrades to the new National Fire Alarm and Signaling Codes can be applied to such sites that meet the requirements set forth in ICC IFC Section

2701.5.1 and 2701.5.2 or for those sites that already meet the following criteria with the focus being on outside emergency communication that is commonly known as mass notification now known as emergency communications systems while other parts of the National Fire Alarm and Signaling Codes can also be applied.

Guidelines:

1. Sites containing hazardous substances subject to **Pub.L. 109-295** that is commonly referred to by the public as the Department of Homeland Security's Chemical Facility Anti-Terrorism Standards (CFATS).
2. Sites containing hazardous substances with a federal recognized classification of **SARA Title III**, Superfund Amendments and Reauthorization Act (SARA) Title III of SARA ("SARA Title III") that is part of the Emergency Planning and Community Right-To-Know Act (EPCRA) requiring a Risk Management Plan (RMP) as part of a site's emergency response also known by the International Fire Code (IFC) as sites/facilities having a Hazardous Materials Management Plan (HMMP) sometimes referred to by federal or state governments as a Crisis Response Plan, Hazardous Material Emergency Plan or Hazardous Material Off-Site Response Plan.
3. Emergency Communication System Upgrade clarification: A site's risk analysis, being the basis of site's emergency communication design will be done by others unless the fire code official is qualified, and the future site designs of an IFC H classification site/facility/structure has a potential of reaching a DHS/CFATS, SARA Title III classification or will meet ICC IFC Section 2701.5.1 and or 2701.5.2 and the requirements when applicable for the new National Fire Alarm and Signaling Codes with their Emergency Communication System (ECS) or is already specified in the site's fire alarm system plans and a site risk analysis is already incorporated into the emergency communication design as part of their overall design is then complete.

K101.2.1 Retroactive emergency communication system upgrade requirements. The option of upgrading a Fire alarm system to the new National Fire Alarm and Signaling Codes for those sites applicable that in the past required emergency HazMat responses or activated their Hazardous Materials Management Plan (HMMP) the local authority having jurisdiction can review the present status of the site/facility with their fire code official and based on the site's risk analysis a system upgrade can be applied.

SECTION K102
REFERENCED STANDARDS

ICC IFC-06 International Fire Code K101.1, K101.2
NFPA 72-2010 National Fire Alarm Code K101.1, K101.2, K101.2.1

Commenter's Reason: This Appendix with its provisions could be a **key element** that could be used to protect millions throughout our nation by giving those governments, communities or tribes etc. who are presently **ICC compliant** the opportunity to enhance emergency communication within their communities by using these new codes.

For many years our nation waited for codes as such to catch up to the NEW state-of-the-art technology being used in emergency communication systems. Just imagine how much deliberation took place when the NFPA they decided to change the name of their new codes that now might have others confused. Within the codes you might find upgrades to one-way, two-way and mass emergency communication systems etc. that many have been waiting for, for many years. Depending on when you have the opportunity to read this proposed appendix you might discover that due to overlapping code development cycles between organizations the printed form of these new code showing you these upgrades may not yet be available so… I recommend that you use the Internet to find updated NFPA information if you would like to do some research.

Since this new terminology maybe a concern, background information is available through the internet by searching for articles such as Emergency Communications Systems and or the new NFPA 72-2010 codes. If you are interested in some detailed information, you could try to contact somebody at the NFPA that you might know who sat on the NFPA 72 development committee who is familiar with the final ratification of these new NFPA 72/National Fire Alarm and Signaling Codes, Emergency Communication Systems specifications etc. and he or she might be able to fill you in or…at least tell you where you can find these new codes changes on their website, that is if you did not already find what you were looking for.

In the past awareness about emergency communication issues were brought to the ICC IFC attention in the attempt to establish a standard within the IFC so emergency communication/notifications systems being a outside annunciator devices /speakers etc. could be installed by code, but now that the NFPA 72 committee has moved forward… in my opinion I think it does not make any sense to have duplicate codes in the IFC, so that is why this proposed appendix with these new codes I believe should now be used.

What did it take for our Federal Government to get involved? Did you know that it actually took a Presidential Executive Order 13407 followed by Congress's involvement with requirements to start to upgrade our national standards to reflect the new state-of-the-art technology in emergency communications? As an end result our Department of Homeland Security is now involved through an agency that presently falls under their umbrella that is called the Federal Emergency Management Agency (FEMA) and in layman's terms, now has a goal to provide alert and warnings throughout our infrastructure no matter what the crisis by using communication systems that could then provide life-saving information no matter where you are located or what time of the day it might be, such as during a natural or man-made disaster/ event… or in times of crisis. This federal government program is commonly known today as the Integrated Public Alert Warning System (IPAWS).

Do you agree? Washington with all of their wisdom forgot the basics, it appears that they forgot that when it comes to upgrading the alert/warning, emergency communication systems used for early warning mass notification everything starts with codes/specifications and implementation of systems with requirements at the local government level. Now do you realize why these upgraded NFPA 72/National Fire Alarm and Signaling Codes are so important?

Understanding why DHS's CFATS and the SARA Title III classifications are being used as guidelines to start a site's analysis are a very important part of this appendix. In this case you need a benchmark based on a time factor of how long it will take local first responders from the first millisecond of the event to be on scene, to then mitigate the event.

As you will discover our federal government gave an industry a wake-up call. The industry that many knew is now changing and by the time you read this proposal you might already be familiar with the following Federal Law, Pub.L.109-295 publicly known as our Department of Homeland Security's (DHS) and their Chemical Facility Anti-Terrorism Standards (CFATS). Keep in mind that DHS is a Security department and not a Code organization. I think you will quickly understand why CFATS is being used as a guideline if not simply contact the Department of Homeland Security and have them explain to you their Top Screening process that they used and how they determined their multiple tier structure to identify certain sites of concern. Once you understand their methods I feel that you will be able to see why this appendix is so important.

The short version back in 2008 after an official release the national media reported that more than 7,000 sites were chosen by using DHS's Top Screening process based on their tier structure as being sites of potential high-risk for terrorist attack. By the time code officials read this information some of the DHS security inspections at these sites that were on the schedule to start in January 2009 should already be completed. DHS should be the first to see how many of these sites with hazardous substances actually have any outside emergency communication warning devices/systems in place and operational to warn the surrounding public who could be outside exposed to the atmosphere when an event containing hazardous substances takes place at their facility that for many years others "assumed" such early warning devices were being installed. Having emergency communication notification systems in place with the ability to warn the public before exposure is one of the reasons for proposing this appendix. For too many years the mind-set has been that the general public will be sitting in their homes or have their electronic devices turned on just waiting for emergency warnings when in reality they are discovering that depending on the geographical area and the time of day that numbers will vary. Note that each geographical area of a site of interest that could be applicable is different and that is why a site analysis study is required. The most important part of our general public which are those who are less fortunate, our poor, the handicapped and those with special needs have a problem. Emergency Communication Systems used for outside early warning notification have the potential of reaching a large percentage of the affected population almost immediately unlike other means that could be subject to system loads and possible time delays. Another factor that has been increasing is the demand on our electrical grid and at times there are areas within our nation who might already be without electrical service (a major power outage), and or do not have telecom, broadcast, or cable connectivity. As the public starts to do their math and these deficiencies are known is strange how quiet it is now getting. Who was responsible for doing the math?

You probably are questioning why the terms SARA Title III is used as a guideline benchmark, it is simple many elected officials understand the term SARA Title III rather than the H classification being used in present code. Since governments, communities or tribes etc. will be involved in the decision-making on whether or not to adopt this proposed Appendix the term SARA that is an abbreviation for Superfund Amendments and Reauthorization Act, which is more universally understood by elected officials or others who participate in their (LEPC) Local Emergency Planning Committees, this terminology should make it easier for fire code officials to work with local governments to determine which sites located within their communities these upgrades and or new installation requirements will apply. Since fire code officials may not be familiar with the new technology in the world of emergency communication, in order to relieve the fire code official of additional burdens as it pertains to the acoustical designs and decision making a site's risk analysis, being the basis of site emergency communication design will be done by others, unless the fire code official is qualified and he or she would like to get involved.

For the second part of this requirement for installation being that if the site's designer already incorporated the new NFPA 72 codes to be known as National Fire Alarm and Signaling Codes, Emergency Communication System codes in the IFC H classification of a site/facility/structure and the acoustical designs including the decision making as it pertains to a site's risk analysis is already in their site design plans, and everything has been accounted for, thus meeting local government and fire code official approval everything should be Good-To-Go.
Please note that designers have been doing acoustical studies/designs for many years and emergency communication systems are being used throughout the world. Now our fire code officials will have an opportunity to have a closer working relationship with their local governments as being the Authority Having Jurisdiction (AHJ) to ensure that all related code preparedness and public safety communication concerns are met.
As discussions at the local level will always seem to continue on how to activate the emergency communications system, being the trigger, that is why a site analysis of the facility/building/structure is done first because each site maybe unique. These are decisions that are made after the appendix is adopted.

As you consider this proposed appendix for approval please keep in mind that this appendix addresses the ability of a community to adopt the appendix so they can use these new NFPA codes to ensure that early warning emergency communication is available for those who may be outside fully exposed to the atmosphere being that of employees at a site/facility or the public in the surrounding community at site/facilities where these code requirements may apply will then be installed by code. Again in doing so this will address the larger portion of the effectiveness of the notification problem because the majority of the public depending on the geographical area and time of day could be outside of their homes and outside emergency communication early warning notification is essential so that they can protect their families by turning on their electronic devices and waiting for further instructions.

For some areas of our nation emergency communication systems as such are already installed at facilities/sites etc. and even emergency communication systems are being used for public community notification so this appendix may have little or no impact on those who choose to adopt this appendix.

Please consider this proposed Appendix with it's provisions/requirements that will give those governments, communities or tribes who are presently ICC compliant the opportunity to protect their communities, families, loved ones and especially those with special needs by using these new codes that many have been waiting for, for so many years.

Cost Impact: The cost impact of this code proposal will depend on many factors such as when this code is adopted, site inspections are done in order to determine what is required after doing a site analysis, the acoustical design and or other actions are performed in order to determine the cost of construction since the emergency communications system in some applications could also be considered an add-on, even an estimated cost of construction cannot honestly be determined at this time because each site will be different.

ICCFILENAME: JACOBY-F2-APPENDIX K.DOC

Public Hearing Results

Note: The following analysis was not in the Code Change monograph but was published on the ICC website at http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf :

Analysis: Review of the proposed new standard P.L. 109-295 indicated that, in the opinion of ICC staff, the standard did not comply with ICC standards criteria, Sections 3.6.2.11 and 3.6.3.2.

Committee Action: **Disapproved**

Committee Reason: The committee felt that the proposal was vague and unenforceable and contains mostly commentary, making it difficult to determine what is required. The committee reiterated its suggestion from its action on a similar proposal in the 2007-2008 cycle that existing technology, such as "Reverse 911", that provide better notification can be used to accomplish many of the proponent's goals without creating the need for outside sirens which already mean something different (weather alert, volunteer fire department alert, etc.) to the public and would generate confusion.

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 self, requests Approval as Modified by this Public Comment.

Replace the proposal as follows:

APPENDIX K
EMERGENCY COMMUNICATION SYSTEMS
(HAZARDOUS SUBSTANCE)

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION K101
GENERAL

K101.1 Scope. This appendix contains provisions that are being made available for adoption by governments, communities or tribes, being local and regional authorities having jurisdiction, giving them an opportunity to adopt the new National Fire Alarm and Signaling Codes in NFPA72-2010 Edition Chapter 24 Emergency Communication System (ECS) in its entirety, to be used in the protection of their communities.

SECTION K102
REFERENCED STANDARDS

NFPA 72-2010	National Fire Alarm and Signaling Code Chapter 24	K101.1

Commenter Reason: At the time this proposal was made in late October 2009 the printed version of the new NFPA 72 National Fire Alarm and Signaling Codes just became available a few days before the hearings and I feel that many did not have ample time to review these new standards in their entirety.

Also after a January 2010 Commission Report that was reported by the media … preparedness issues I feel will now be at the top of the agenda for many throughout our nation.

I will now try to clarify what my requirement is in this proposal. For those who would like to adopt this appendix it will give those who in the past adopted ICC IFC codes and had or now have emergency communication concerns, an opportunity to use the provision within this appendix so that they can adopt the NFPA 72-2010 new **Chapter 24** in its entirety as requirements, that can then be use to protect their communities.

From this point on, I feel that further detailed justification for this proposed Appendix is no longer necessary, but I will still be making my general reasons-comments available for voting members so that they can decide whether or not this proposal has merit and should be made available to local communities to protect the public and their first responders.

Sadly to say many areas already invested into an old concept dating back many years that assumes that the general public will be sitting by their telephones or in front of their entertainment devices that are subject to power outages, satellite (atmospheric) and hard wiring connectivity issues etc. during natural or man made emergencies or in extreme times of crisis, and that is why others throughout our nation for a long time have been looking at these problems which has resulted in the identification of a series of information and messaging needs in emergency communication so that local and regional Authorities Having Jurisdiction (AHJ) now have codes/specifications available as they try to protect their communities.

This appendix is addressing local preparedness issues and system upgrades.

Whether or not you agree with Emergency Voice Alarm Communications (EVAC) HazMat Alerting (HA) emergency or mass communication/ notification system concepts I am sure that you realize that system upgrades when available are beneficial.

I will continue to reinforce my reason for why this appendix is so important by using the following Real Time example:

Ironically while I am preparing my comments for justification, parts of our nation are without power, and last reported the numbers are now into the hundreds of thousands while others experienced heavy snowfall, ice, downed telephone lines with more snow on the way. It is now being reported that many of the surrounding states, up to five are already in a state of emergency that includes Washington DC, breaking their national records and in one of the surrounding areas it was reported the snowfall was up to 40 inches, in other areas they've been without power for days and believe it or not more snow is being forecast in 72 hours. Last reported in some areas it will still… take days to restore power.

I am hoping that by now you understand why these emergency communication upgrades were made to our emergency and mass notification systems, and why it is so important for those who are ICC IFC compliance to have the opportunity of using the new National Fire Alarm and Signaling Codes to protect their communities if so desired?

Cost Impact: The cost of adoption should be zero.

Final Action: AS AM AMPC____ D