2016 GROUP B PUBLIC COMMENT AGENDA

OCTOBER 19 - OCTOBER 25, 2016
KANSAS CITY CONVENTION CENTER
KANSAS CITY, MO
Proposed Change as Submitted

Proponent: Gregory Cahanin, Cahanin Fire & Code Consulting, representing American Hydrotech (gcahanin@assuredfiresafety.com)

2015 International Fire Code
Add new definition as follows:

SECTION 202 DEFINITIONS

GENERAL DEFINITIONS

RUBBERIZED ASPHALT MELTER (Melter). Portable equipment used for the heating of rubberized asphalt material. The term applies only if both the material being heated is a mix of asphalt and inert material and when an indirect method of heating is used. An indirect method of heating refers to a fully enclosed double-shell oil or air system that transfers heat from a burner(s) or electric heating element(s) to the oil or air jacket around the outside of a material vat which then heats the rubberized asphalt material. Melters can be fueled by means of diesel or electric means. Melters are not considered asphalt (tar) kettles or pots as addressed in Section 303.

Add new text as follows:

SECTION 304 RUBBERIZED ASPHALT MELTERS FOR ROOF DECK SYSTEMS

304.1 General The provisions of this section shall apply to any type of fully enclosed chassis-mounted or portable rubberized asphalt melter using indirect heating of a mix of asphalt and inert material for application on roofs decks. There shall be no direct burner or flame impingement on the material vat with indirect heating. Temperature rise in the material vat is gradual and controlled.

304.2 Permits Permits shall be required in accordance with Section 105.6 and Chapter 35.

304.2.1 Torches. Any use of torches or burners shall require a separate permit in accordance with Chapter 35.

304.3 Location. The melter shall be located and operated in a controlled area. The area shall be as designated by the fire code official and identified by the use of traffic cones, barriers, and other suitable means. Where rubberized asphalt melters are staged and operated on roof decks, the design load of the roof deck shall be capable of supporting the weight of the rubberized asphalt melter where loaded to capacity with rubberized asphalt material. The design load of the roof deck shall be as determined on building drawings or by a design professional as approved by the fire code official. Rubberized asphalt melters shall be chocked in place on the roof deck at locations identified by the design professional and as approved by the fire code official. Rubberized asphalt cakes for use in rubberized asphalt melters shall be located on the roof at a location agreed upon by the design professional and the fire code official.

304.3.1 Buildings. Rubberized Asphalt Melters shall not be located inside buildings.

304.3.2 Air intakes. Air intakes into the building in the area of work shall be identified and shut off and an alternate supply of outdoor air into the building shall be coordinated, such as by temporarily covering air intakes to make them smoke and odor proof.

304.3.3 Exits. Rubberized asphalt melters shall not be located within 20 feet of any exit or combustible material. Rubberized asphalt melters shall not block any means of egress.

304.3.4 Combustible materials. Combustible materials on the roof deck shall be protected in accordance with Section 3504.

304.4 Fire Extinguishers. Not less than two approved 4-A:40-B:C fire extinguishers complying with Section 906 shall be provided and maintained within 25 ft. of the rubberized asphalt melter. A minimum of one approved 4-A:40-B:C fire extinguisher shall be provided in close proximity to the roofing material application. Each employee shall be instructed on the proper use of fire extinguishers and in the event of a fire to turn off all rubberized asphalt melter power supply, engines, and burners. Employees shall notify the fire department.

304.5 Attendant Supervision. An operating rubberized asphalt melter shall be attended by an employee who is knowledgeable and solely dedicated to the operation of the equipment and associated hazards. The employee shall always be within 25 ft. of the Melter and shall have the Melter within sight. The employee shall remain in the area of the Melter for a minimum of one-hour after the device is shut down in compliance with Section 3504.2.

304.6 Minimum Melter Design Requirements. Rubberized asphalt melter shall be operated as a complete unit as
designed and built by the manufacturer. Field changes that override controls or safety features are prohibited. Material vats shall be a permanent integral part of the rubberized asphalt melter unit. The rubberized asphalt melter chassis shall be substantially constructed and capable of carrying the load imposed upon it whether it is standing still or being transported.

304.6.1 Lids. Rubberized asphalt melter shall have lids permanently attached. The lids shall be kept closed at all times, except to add rubberized asphalt membrane cakes to the rubberized asphalt melter. Loading doors shall be designed as a safety door integral to the roofing material tank and shall be provided with handles that allow rubberized asphalt cakes to be lowered into the tank without operator exposure to the vat material.

304.7 Melter Operation Rubberized asphalt melters shall be operated according to manufacturer instructions. Rubberized asphalt melters shall operate using integral control systems that include shut off controls for the electric or diesel-fired burner, temperature controls for the oil or air system, and the material vat. Where a diesel burner is utilized, it shall fire into a burner flue assembly for the oil or air jacketed shell for uniform heat transfer to the material vat. There shall be no open flame devices on rubberized asphalt melters. All rubberized asphalt melters shall have an approved, working visible temperature gauge(s) that indicate the temperature of the rubberized material being heated and, in the case of oil jacketed rubberized asphalt melters, the temperature of the heat transfer oil heating the material vat. The rubberized asphalt melter shall have limit switches that prevent the material vat from heating beyond 400 degrees F.

304.8 Fuel System and containers Fuel containers for diesel-powered melters shall be constructed and approved for the use for which they were designed. Rubberized asphalt melter fuel tanks shall be attached to the frame of the melter. Portable fuel tanks shall not be utilized to power rubberized asphalt melters. Diesel tanks and engines integral to rubberized asphalt melters shall be maintained in accordance with manufacturer instructions.

304.8.1 Refueling. Refueling of diesel tanks shall be performed when the rubberized asphalt melter is off. A refueling and spill prevention plan approved by the fire code official shall be utilized. Refueling shall be conducted using approved safety cans. No open flames shall be present within 20 feet of the refueling operation.

304.9 Maintenance. Rubberized asphalt melters and integral working parts shall be in good working condition and shall be maintained free of excessive residue.

304.10 Transporting. Rubberized asphalt melters shall not be transported over a highway, road, or street when the heat source for the melter is operating.

3317.1 General. Roofing operations utilizing heat-producing systems or other ignition sources shall be conducted in accordance with Sections 3317.2, 3317.3 and 3317.4 and Chapter 35.

3317.4 Rubberized Asphalt Melters. Rubberized Asphalt Melters shall be operated in accordance with Section 304.

Reason: The inherent dangers of open flames as a part of construction processes has been recognized with particular emphasis on the use of torch applied roofing systems and asphalt (tar) kettles for decades. Tar kettles lack temperature controls, are open flame fired, and operate at higher temperatures than Rubberized Asphalt Melters. The IFC contains requirements and cautions for tar kettles and torch applied roofing systems in Chapter 3 that specifically addresses use of tar kettles with heavy reliance on Chapter 35 requirements. Tar kettles are not permitted to be staged on roof decks in Section 303.2. Rubberized Asphalt Melters due to the inherent materials application requirement in close proximity to the roof deck requires that Melters be permitted on roof decks.

The historical need for improved deck coatings resulted in the development and long-term positive record of hot-applied rubberized asphaltic materials. Rubberized asphalt can only be melted in Rubberized Asphalt Melters that control temperatures. Currently each AHJ must independently develop and approve safe work practices for each construction job using Rubberized Asphalt Melters without the benefit of established requirements.

There have been no roof deck failures with zero fires and zero litigation from the use of these materials and equipment on over 30 million square feet of roof decks in Florida alone. Nationally the submitter cannot find an instance where a roofing fire was initiated by a Rubberized Asphalt Melter; a notable record in comparison to asphalt tar kettle fire events.

This code change is to establish that Melters are NOT tar kettles and must comply with a different set of fire safety provisions as proposed here. Significantly, Melter equipment is operated without an open flame. Melters have controls built into manufactured units. Material vats are fully enclosed. Melter equipment enables the use of advanced roof covering materials that protect the structural integrity of concrete high-rise or commercial structures.

The proposed change to the IFC is important in establishing the safe use requirements for Rubberized Asphalt Melters. Tar kettle and Melter operations need safeguards against the potential for fire, but with different constraints. This proposal separates out Rubberized Asphalt Melters for use on roof decks and brings with it recognition of fire safety as an integral part of
the roofing operation. Propane fueled equipment is not part of the safe work practices in this proposal as called out in Section 304.1.1. With this change a propane fueled Rubberized Asphalt Melter could only be utilized with AHJ approval that would include additional locally established controls and work practices for propane.

Rubberized Asphalt Melters operate and perform differently from tar kettles as listed in the table below. Importantly, indirect heating of the Rubberized Asphalt Melter is via fully enclosed electric or diesel heating elements. Further, there are temperature controls inherent in melters in part due to the need to maintain the roofing material at 350 to 380 degrees F. Overheating into the temperature range of ordinary combustibles makes the rubberized asphalt product unsuitable for roof deck application. Due to the lower application temperature, the potential for fire with Rubberized Asphalt Melters is greatly decreased when compared to tar kettles and torches. Tar kettles operate in temperature ranges 475-500 degrees F.

The proposal provides for only approved equipment and methods to be permitted on non-combustible roof locations, insures exit access is always maintained, and to provides for fire extinguishers and responsible operation of equipment consistent with existing IFC requirements in Chapter 35. The equipment construction and operation requirements are such that only a properly manufactured unit can be used. Multiple national manufacturers have equipment capable of meeting the requirements proposed herein. Confirmation of roof deck ability to accommodate equipment loads prior to work beginning is a key part of the AHJ review and permitting process.

The goal of these new requirements is to define operations necessary during construction as needing to be performed in a safe manner that will not put workers or the building at unnecessary risk from fire. This proposal for Rubberized Asphalt Melters is consistent with the intent of the code.

<table>
<thead>
<tr>
<th>Tar Kettles Versus Rubberized Asphalt Melters</th>
</tr>
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<tbody>
<tr>
<td>Tar Kettles</td>
</tr>
<tr>
<td>1. Exposed Burner Flame</td>
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<tr>
<td>2. Burner Type: LP Fired</td>
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<tr>
<td>3. Gasoline Fueled Engine</td>
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<tr>
<td>4. Tar Kettles don’t require temperature controls</td>
</tr>
<tr>
<td>5. Temperature controls if present may be bypassed</td>
</tr>
<tr>
<td>6. Tar Kettle will operate if control system is down</td>
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<tr>
<td>7. Burners fire into flue unit for high heat transfer</td>
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<tr>
<td>9. BTU Output: 1 Million BTU per burner X 2 burners</td>
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<tr>
<td>10. Typical application temp 475-5000 degrees F</td>
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</tbody>
</table>

**Bibliography:** none

**Cost Impact:** Will not increase the cost of construction

Rubberized Asphalt roof coverings are installed throughout the U.S. and internationally. In each jurisdiction, because they do not have a code mandated s criteria for Safe Working Practices, each jobsite must produce for review and acceptance a
procedure. The codifying of these Safe Work Practice provisions will mean AHJ's will have clear established criteria for enforcement that contractors must abide by. By eliminating a 'one off' criteria for every roofing installation in favor of these changes Rubberized Asphalt Melter acceptance time and costs for AHJ review and contractor compliance will be reduced.

Public Hearing Results

Committee Action: Disapproved
Committee Reason: The concept was acceptable but many concerns were raised on the requirements contained within the new section. First there were concerns with the difficulty in complying with the location section. A registered design professional is needed simply to place upon a building. The requirement of staff being with 25 feet in Section 304.5 was seen as unenforceable. Another concern is determining how much air is adequate as required by Section 304.3.2. The definitions appear to contain requirements and it was felt that fire extinguishers are better addressed in Section 906 with simply a reference from this section. Other concerns relate to how an "employee" is to be defined, what is considered a "controlled area" and the ease of obtaining building drawings.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent : Gregory Cahanin, Chanin Fire & Code Consulting, representing American Hydrotech (firemc2@tampabay.rr.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

SECTION 202 DEFINITIONS

GENERAL DEFINITIONS

RUBBERIZED ASPHALT MELTER RUBBERIZED ASPHALT. - A thermoplastic roofing and waterproofing material composed primarily of non-oxidized asphalt formulated with rubber polymer and inert fillers.

RUBBERIZED ASPHALT MELTER (Melter MELTER). Portable equipment used for the heating of to indirectly heat rubberized asphalt material. The term applies only if both the material being heated is a mix of asphalt and inert material and when an indirect method of heating is used. An indirect method of heating refers to a fully enclosed double-shell oil or air system that transfers heat from a burner(s) or electric heating element(s) to the oil or air jacket around the outside of a material vat which then heats the rubberized asphalt material in preparation for application on roof decks. Melters can be fueled by means of diesel or electric means. Melters are not considered asphalt (tar) kettles or pots as addressed in Section 303.

304.10 Transporting. - Rubberized asphalt melters shall not be transported over a highway, road, or street when the heat source for the melter is operating.

304.1 General The provisions of this section Section 304 shall apply to any type of fully enclosed chassis-mounted or portable rubberized asphalt melter using indirect heating of a mix of to prepare rubberized asphalt and inert material for application on roods. An indirect method of heating refers to a fully enclosed double-shell oil or air system that transfers heat from a burner(s) or electric heating element(s) to the oil or air jacket around the outside of a material vat which then heats the rubberized asphalt. There shall be no direct burner or flame impingement on the material vat with indirect heating. Temperature rise Melters are not to considered asphalt (tar) kettles or pots. Asphalt (tar) kettles and pots shall be in the material vat is gradual and controlled accordance with Section 303.

304.1.1 Propane melter. A rubberized asphalt melter using indirect heating to prepare rubberized asphalt for application on roof decks powered by propane shall only be utilized as approved by the fire code official.

304.2.1 Torches. Any use of hand-held torches or burners shall require a separate permit in accordance with Chapter 35.

2016 ICC PUBLIC COMMENT AGENDA
304.3 Location. Melters shall be permitted to be staged and operated on roof decks of noncombustible construction. The melter shall be located and operated in a controlled area. The area shall be approved and designated by the fire code official and, the controlled area shall be identified by the use of traffic cones, barriers, and other suitable means. Where rubberized asphalt melters are staged and operated on roof decks, the design load of the roof deck shall be capable of supporting the weight of the rubberized asphalt melter where loaded to capacity with rubberized asphalt material. The design load of the roof deck shall be as determined on building drawings or by a design professional as approved by the fire code official. Rubberized asphalt melters shall be chocked in place on the roof deck at locations identified by the design professional and as approved by the fire code official. Rubberized asphalt cakes for use in rubberized asphalt melters shall be located on the roof at a location agreed upon by the design professional and the fire code official.

304.3.1 Buildings. Rubberized Asphalt Melters. Rubberized asphalt melters shall not be located inside buildings of any building.

304.3.3 Exits. Rubberized asphalt melters shall not be located within 20 feet of any exit or combustible material. Rubberized asphalt melters shall not block any means of egress.

304.3.4 Combustible materials. Combustible materials on the roof deck shall be protected in accordance with Section 3504.

304.4 Fire Extinguishers. Not less than two approved 4-A:40-B:C fire extinguishers complying with Section 906 shall be provided and maintained within 25 ft. of the rubberized asphalt melter. A minimum of one approved 4-A:40-B:C fire extinguisher shall be provided in close proximity to the roofing material application. Each employee shall be instructed on the proper use of fire extinguishers and in the event of a fire to turn off all rubberized asphalt melter power supply, engines, and burners. Employees shall notify the fire department.

304.5 Attendant Operator Supervision. An operating Rubberized asphalt melter shall be attended by an employee operator who is knowledgeable and solely dedicated to the operation of the equipment and associated hazards. The employee operator shall always be within 25 ft. of the Melter and shall have the Melter within sight. The employee operator shall remain in the area of the Melter for a minimum of one-hour after the device melter is shut down in compliance with Section 3504.2.-

304.6 Minimum Melter Design Requirements. Construction. Rubberized asphalt melter Melters shall be operated as a complete unit as designed and built by the manufacturer. Field changes that override controls or safety features are prohibited. Material vats shall be a permanent integral part of the rubberized asphalt melter unit. The rubberized asphalt melter shall be substantially constructed and capable of carrying the load imposed upon it whether it is standing still or being transported.

304.6.1 Lids. Rubberized asphalt melter Melters shall have lids permanently attached lids covering the material vat. The Melter lids shall be kept closed at all times, except to add rubberized asphalt membrane rubberized asphalt cakes to the rubberized asphalt melter. Loading doors shall be designed as a safety door integral to the roofing rubberized asphalt material tank vat and shall be provided with handles that allow rubberized asphalt rubberized asphalt cakes to be lowered into the tank vat without operator exposure to the vat material.

304.7 Melter Operation. Rubberized asphalt melters. Melters shall be operated according to manufacturer instructions. Rubberized asphalt melters Melters shall operate using integral control systems that include shut off controls for the electric or diesel-fired burner, temperature controls for the oil or air system, and the material vat. Where a enclosed diesel burner is utilized, it shall fire into a burner flue assembly for the oil or air jacketed shell for uniform heat transfer to the material vat. There shall be no open flame devices on rubberized asphalt melters. All rubberized asphalt melters shall have an approved, working visible temperature gauge(s) that indicate the temperature of the rubberized material being heated and, in the case of oil jacketed rubberized asphalt melters, the temperature of the heat transfer oil heating the material vat. The rubberized asphalt meltershall have limit switches that prevent the material vat from heating beyond 400 degrees F.

304.8 Fuel System and containers. Fuel containers for diesel-powered melters shall be constructed and approved for the use for which they were designed. A rubberized asphalt melter Melter fuel tanks shall be permanently attached to the frame of the melter. Portable fuel tanks shall not be utilized to power rubberized asphalt melters. Diesel tanks and engines integral to the rubberized asphalt melters melter shall be maintained in accordance with manufacturer instructions.
304.8.1 Refueling. Refueling of diesel tanks shall be performed when the rubberized asphalt melter is off. A refueling and spill prevention plan approved by acceptable to the fire code official shall be utilized. Refueling shall be conducted using approved safety cans. No open flames shall be present within 20 feet of the refueling operation.

304.9 Maintenance. Rubberized asphalt melters and integral working parts shall be in good working condition and shall be maintained free of excessive residue.

3317.1 General. Roofing operations utilizing heat-producing systems or other ignition sources shall be conducted in accordance with Sections 3317.2, 3317.3 and 3317.4 and Chapter 35.

3317.4 Rubberized Asphalt Melters. Rubberized Asphalt Melters shall be operated in accordance with Section 304.

Commenter's Reason: The original proposal used the IFC tar kettle provisions as a template. The majority of the committee comments on improper code language relate directly to tar kettle provisions now in the IFC. This revised provision removes concerns raised by the committee on language and enforceability. The Location section is revised to define where Melters may be located. Definitions are revised to remove perceived design requirements.

The inherent dangers of open flames as a part of construction processes has been recognized with particular emphasis on the use of torch applied roofing systems and asphalt (tar) kettles for decades. Tar kettles lack temperature controls, are open flame fired, and operate at higher temperatures than Rubberized Asphalt Melters. The IFC contains requirements and cautions for tar kettles and torch applied roofing systems in Chapter 3 that specifically addresses use of tar kettles with heavy reliance on Chapter 35 requirements. Tar kettles are not permitted to be staged on roof decks in Section 303.2. Rubberized Asphalt Melters due to the inherent materials application requirement in close proximity to the roof deck requires that Melters be permitted on roof decks.

The historical need for improved deck coatings resulted in the development and long-term positive record of hot-applied rubberized asphaltic materials. Rubberized asphalt can only be melted in Rubberized Asphalt Melters that control temperatures. Currently each AHJ must independently develop and approve safe work practices for each construction job using Rubberized Asphalt Melters without the benefit of established requirements.

There have been no roof deck failures with zero fires and zero litigation from the use of these materials and equipment on over 30 million square feet of roof decks in Florida alone. Nationally the submitter cannot find an instance where a roofing fire was initiated by a Rubberized Asphalt Melter; a notable record in comparison to asphalt tar kettle fire events.

This code change is to establish that Melters are NOT tar kettles and must comply with a different set of fire safety provisions as proposed here. Significantly, Melter equipment is operated without an open flame. Melters have controls built into manufactured units. Material vats are fully enclosed. Melter equipment enables the use of advanced roof covering materials that protect the structural integrity of concrete high-rise or commercial structures.

The proposed change to the IFC is important in establishing the safe use requirements for Rubberized Asphalt Melters. Tar kettle and Melter operations need safeguards against the potential for fire, but with different constraints. This proposal separates out Rubberized Asphalt Melters for use on roof decks and brings with it recognition of fire safety as an integral part of the roofing operation. Propane fueled equipment is not part of the safe work practices in this proposal as called out in Section 304.1.1. With this change a propane fueled Rubberized Asphalt Melter could only be utilized with AHJ approval that would include additional locally established controls and work practices for propane.

Rubberized Asphalt Melters operate and perform differently from tar kettles as listed in the table below. Importantly, indirect heating of the Rubberized Asphalt Melter is via fully enclosed electric or diesel heating elements. Further, there are temperature controls inherent in melters in part due to the need to maintain the roofing material at 350 to 380 degrees F. Overheating into the temperature range of ordinary combustibles makes the rubberized asphalt product unsuitable for roof deck application. Due to the lower application temperature, the potential for fire with Rubberized Asphalt Melters is greatly decreased when compared to tar kettles and torches. Tar kettles operate in temperature ranges 475- 500 degrees F.

The proposal provides for only approved equipment and methods to be permitted on non-combustible roof locations, insures exit access is always maintained, and to provide for fire extinguishers and responsible operation of equipment consistent with existing IFC requirements in Chapter 35. The equipment construction and operation requirements are such that only a properly manufactured unit can be used. Multiple national manufacturers have equipment capable of meeting the requirements proposed herein. Confirmation of roof deck ability to accommodate equipment loads prior to work beginning is a key part of the AHJ review and permitting process.

The goal of these new requirements is to define operations necessary during construction as needing to be performed in a safe manner that will not put workers or the building at unnecessary risk from fire. This proposal for Rubberized Asphalt Melters is consistent with the intent of the code.
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<td></td>
<td>1. Fully Enclosed Burner Flame</td>
</tr>
<tr>
<td>Exposed Burner Flame</td>
<td>2. Diesel or Electric Fired</td>
</tr>
<tr>
<td>Burner Type: LP Fired</td>
<td>3. Diesel or Electric Fueled</td>
</tr>
<tr>
<td>Gasoline Fueled Engine</td>
<td>4. Cannot purchase a Melter without temperature controls</td>
</tr>
<tr>
<td>5. Temperature controls if present may be bypassed</td>
<td>5. Temperature controls cannot be bypassed</td>
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<tr>
<td>6. Tar Kettle will operate if control system is down</td>
<td>6. Control systems must be operating correctly for Melter to run</td>
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<td>7. Burners fire into flue unit for high heat transfer</td>
<td>7. Burner fires into air or oil jacketed tank for uniform heat transfer</td>
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<tr>
<td>9. BTU Output: 1 Million BTU per burner X 2 burners</td>
<td>9. BTU Output 250 K BTU's with one burner on Melter</td>
</tr>
<tr>
<td>10. Typical application temp 475-500 degrees F</td>
<td>10. Typical Asphalt application 350-380 degrees F</td>
</tr>
</tbody>
</table>
Committee Action: Approved as Submitted

Assembly Action: None

Proposed Change as Submitted

Proponent: Michael O’Brien representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code

Revise as follows:

304.3.3 Capacity exceeding 1.5 cubic yards. Dumpsters and containers with an individual capacity of 1.5 cubic yards [40.5 cubic feet (1.15 m^3)] or more shall not be stored in buildings or placed within 5 feet (1524 mm) of combustible walls, openings or combustible roof eave lines.

Exceptions:

1. Dumpsters or containers that are placed inside buildings in areas protected by an approved automatic sprinkler system installed throughout in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.

2. Storage in a structure shall not be prohibited where the structure is of Type I or II A construction, located not less than 10 feet (3048 mm) from other buildings and used exclusively for dumpster or container storage.

3. Dumpsters or containers that are located adjacent to buildings where the exterior area is protected by an approved automatic sprinkler system.

Reason: This proposal is a clarification of the requirements. The first exception simply “dumpsters or containers in areas protected” by sprinklers. Does this mean that it would be allowed outside adjacent to the building if the building is sprinklered? Probably not, since the sprinklers would afford no protection over the dumpster. Therefore, Exception 1 is reworded to be specific to indoor locations and Exception 3 is added to address outdoor locations where the dumpster is not required to be separated 5 feet.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Cost Impact: Will not increase the cost of construction

This proposal does not address construction, it addresses the location of the dumpster in relation to the building.

Public Hearing Results

Committee Action: Approved as Submitted

Committee Reason: This was seen as a good differentiation between dumpsters within buildings and those located adjacent to buildings. The addition of the allowance for dumpsters placed next to a building, where sprinklers are provided, was seen as a necessary option and clarified the intent of the original exceptions.

Assembly Action: None

Individual Consideration Agenda

Proponent: Albert Rood, representing SELF (al.rood@wyo.gov) requests Disapprove.

Commenter’s Reason: Allowing large capacity dumpsters per 304.3.4 to be placed inside the building, close to or under openings and combustible construction is stepping over boundaries of simple common sense prevention principals and the original intent of this section of exposure issues. The exceptions need to go away “Not be modified”
**Proposed Change as Submitted**

**Proponent**: William Freer, New York State Office of Fire Prevention and Control, representing New York State Office of Fire Prevention and Control (william.freer@dhses.ny.gov)

**2015 International Fire Code**

**308.4.1 Group R-2 dormitories.** Candles, incense and similar open-flame-producing items shall not be allowed in sleeping units. **Proposed Change as Submitted**

**Reason**: This code change clarifies where the code applies. In the previous version it was questionable whether or not the code applied to apartment or suite style dormitories.

**Cost Impact**: Will not increase the cost of construction

There is no impact to the cost of construction. The code change clarifies where items are allowed and does not have an effect on the construction of the space.

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**Public Hearing Results**

**Committee Action**: Approved as Modified

**Modification**: 308.4.1 Group R-2 dormitories **Proposed Change as Submitted**

**Committee Reason**: The committee approved this proposal based upon the published reason statement. In addition, it removes confusion that often occurs as to what is considered part of the sleeping unit. A modification removed the reference to Group R-2 as smoking is a concern in all dormitories not simply Group R-2 dormitories.

**Assembly Action**: None

**Individual Consideration Agenda**

**Proponent**: David Collins, The Preview Group, Inc., representing The American Institute of Architects (dcollins@preview-group.com) requests Disapprove.

**Commenter's Reason**: This code change revises the current prohibition against candles, incense and other open-flame producing items in Group R-2 dormitories by deleting the modifier 'sleeping units' and changing 'not be allowed' to 'is prohibited'. The committee recommended approval. The AIA believes this makes the code less clear and difficult to understand. The committee stated that it "approved this proposal based upon the published reason statement. In addition, it removes confusion that often occurs as to what is considered part of the sleeping unit. A modification removed the reference to Group R-2 as smoking is a concern in all dormitories not simply Group R-2 dormitories."

The proponent says that this clarifies whether the code applies to apartment or suite-style dorms, but the proposed change seems to actually be making the application of this section more blurry by deleting the modifier of 'sleeping units' from the section. The problem created here is tied to the definition of dormitory. Is a building comprised of apartments for college students, with more than one student per apartment, considered a dormitory? Is it an apartment or a dormitory if each unit is a complete dwelling unit? We ask for disapproval in the absence of clarification. How would this be enforced in buildings near a university or college?

We believe that if the concern is valid, and we don't question that, shouldn't the limitation be for all living arrangements, not only dormitories.
Committee Action: Disapproved

Assembly Action: None

F10-16 : 310.2, 310.3.

Proposed Change as Submitted

Proponent: John Williams, CBO, representing Adhoc Healthcare Committee (AHC@iccsafe.org)

2015 International Fire Code

Revise as follows:

310.2 Prohibited areas. Smoking shall be prohibited where conditions are such as to make smoking a hazard, and in spaces where flammable liquids or combustible materials, gases and dusts or oxygen are used, stored or handled.

310.3 "No Smoking" signs. The fire code official is authorized to order the posting of "No Smoking" signs in a conspicuous location in each structure or location in which smoking is prohibited. The content, lettering, size, color and location of required "No Smoking" signs shall be approved.

Exception: In Group I-2 occupancies and ambulatory care facilities where smoking is prohibited throughout the facility, "No Smoking" signs are not required in interior locations of the facility where signs are displayed at all major entrances into the facility.

Reason: The intention of this code change is to provide clarification for the spaces and hazards where smoking shall be prohibited. Also, to clarify where "No Smoking" signage is applicable and the I- Occupancies exceptions to the "No Smoking" signage locations based on a totally smoke free facility.

This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2014 and 2015 the ICC Ad Hoc Committee has held 4 open meetings and numerous Work Group meetings and conference calls for the current code development cycle which included members of the committees as well as any interested party to discuss and debate the proposed changes. Information on the AHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the AHC effort can be downloaded from the AHC website at: AHC (http://www.iccsafe.org/cs/AHC/Pages/default.aspx).

Cost Impact: Will not increase the cost of construction

The result would be a decrease in the number of signs needed in a building.

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The proposal was disapproved with concern that the proposal needs to be rewritten to clarify the intent. This is also based upon concern from the proponent that the original proposal needed rework. An acceptable alternative was not presented that the committee felt met the concern with appropriately addressing the intent of the section.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: John Williams, CBO, representing Adhoc Healthcare Committee (AHC@iccsafe.org) requests Approve as Modified by this Public Comment.

Further Modify as Follows:

2015 International Fire Code

310.2 Prohibited areas. Smoking shall be prohibited where conditions are such as to make smoking a hazard, and in spaces where flammable liquids or combustible materials, gases and dusts or oxygen materials are used, stored or handled.

310.3 "No Smoking" signs. The fire code official is authorized to order the posting of "No Smoking" signs in a conspicuous location in each structure or location in which smoking is prohibited. The content, lettering, size, color and location of required "No Smoking" signs shall be approved.
**Exception:** In Group I-2 occupancies and ambulatory care facilities where smoking is prohibited throughout the facility, "No Smoking" signs are not required in interior locations of the facility where signs are displayed at all major entrances into the facility.

**Commenter's Reason:** The committee disapproved this change due to concerns about the language in Section 310.2. The modification restores Section 310.2 and is to include only the originally proposed change to Section 310.3. The original code change added 'ambulatory care' to the exception. The exception for no-smoking signage is only acceptable if the entire building is no-smoking. While typically a Group I-2 occupancy is an entire building, this new language is needed in multi-tenant buildings that include ambulatory care facilities.
105.6.16 Fire hydrants and valves. An operational permit is required to use or operate fire hydrants or valves intended for fire suppression purposes that are installed on water systems and accessible to a fire apparatus access road that is open to or generally used by the public.

Exception: A permit is not required for authorized employees of the water company that supplies the system or the fire department to use or operate fire hydrants or valves.

106.3 Concealed work. It shall be the duty of the permit applicant to cause the work to remain accessible and exposed for inspection purposes. Where any installation subject to inspection prior to use is covered or concealed without having first been inspected, the fire code official shall have the authority to require that such work be exposed for inspection. Neither the fire code official nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

107.5 Rendering equipment inoperable. Portable or fixed fire-extinguishing systems or devices, and fire-warning systems, shall not be rendered inoperative or inaccessible except as necessary during emergencies, maintenance, repairs, alterations, drills or prescribed testing.

Add new definition as follows:

SECTION 202 DEFINITIONS

GENERAL DEFINITIONS

[MA] ACCESS (TO). That which enables a device, appliance or equipment to be reached by ready access or by a means that first requires the removal or movement of a panel, door or similar obstruction [see also “Ready access (to)”].

[MRA] READY ACCESS (TO). That which enables a device, appliance or equipment to be directly reached, without requiring the removal or movement of any panel, door or similar obstruction [see “Access (to)”].

WILDFIRE RISK AREA. Land that is covered with grass, grain, brush or forest, whether privately or publicly owned, which is so situated or is of such inaccessible location that a fire originating upon it would present an abnormally difficult job of suppression or would result in great or unusual damage through fire or such areas designated by the fire code official.

309.2 Battery chargers. Battery chargers shall be of an approved type. Combustible storage shall be kept not less than 3 feet (915 mm) from battery chargers. Battery charging shall not be conducted in areas accessible to the public.

311.2.1 Security. Exterior and interior openings accessible to other tenants or unauthorized persons shall be boarded, locked, blocked or otherwise protected to prevent entry by unauthorized individuals. The fire code official is authorized to placard, post signs, erect barrier tape or take similar measures as necessary to secure public safety.

315.6 Storage in plenums. Storage shall not be permitted in plenums. Abandoned material in plenums shall be deemed to be storage and shall be removed. Where located in plenums, the accessible portion of abandoned cables that are not identified for future use with a tag shall be deemed storage and shall be removed.

316.2.1 Exterior access to shaftways. Outside openings accessible to the fire department and that open directly on a hoistway or shaftway communicating between two or more floors in a building shall be plainly marked with the word SHAFTWAY in red letters not less than 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible from the outside of the building.

403.10.2.2.1 Guide contents. A fire emergency guide shall describe the location, function and use of fire protection equipment.
and appliances accessible to available for use by residents, including fire alarm systems, smoke alarms and portable fire extinguishers. Guides shall include an emergency evacuation plan for each dwelling unit.

504.1 Required access. Exterior doors and openings required by this code or the International Building Code shall be maintained readily accessible with ready access for emergency access by the fire department. An approved access walkway leading from fire apparatus access roads to exterior openings shall be provided when required by the fire code official.

509.2 Equipment access. Approved access shall be provided and maintained for all fire protection equipment to permit immediate safe operation and maintenance of such equipment. Storage, trash and other materials or objects shall not be placed or kept in such a manner that would prevent such equipment from being readily accessible having ready access.

603.1.5 Access. The installation shall be readily accessible have ready access for cleaning hot surfaces; removing burners; replacing motors, controls, air filters, chimney connectors, draft regulators and other working parts; and for adjusting, cleaning and lubricating parts.

603.1.6.1 Diagrams. Contractors installing industrial oil-burning systems shall furnish not less than two copies of diagrams showing the main oil lines and controlling valves, one copy of which shall be posted at the oil-burning equipment and another at an approved location that will be accessible have access in case of emergency.

605.12 Abandoned wiring in plenums. Accessible portions Portions of abandoned cables in air-handling plenums plenum that have access shall be removed. Cables that are unused and have not been tagged for future use shall be considered abandoned.

606.5 Access. Refrigeration systems having a refrigerant circuit containing more than 220 pounds (100 kg) of Group A1 or 30 pounds (14 kg) of any other group refrigerant shall be accessible to have access for the fire department at all times as required by the fire code official.

608.4.1 Separate rooms. Where stationary batteries are installed in a separate equipment room accessible with access to only to authorized personnel, they shall be permitted to be installed on an open rack for ease of maintenance.

703.1 Maintenance. The required fire-resistance rating of fire-resistance-rated construction, including, but not limited to, walls, firestops, shaft enclosures, partitions, smoke barriers, floors, fire-resistive coatings and sprayed fire-resistant materials applied to structural members and fire-resistant joint systems, shall be maintained. Such elements shall be visually inspected by the owner annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained. Where concealed, such elements shall not be required to be visually inspected by the owner unless the concealed space is accessible accessed by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space. Openings made therein for the passage of pipes, electrical conduit, wires, ducts, air transfer openings and holes made for any reason shall be protected with approved methods capable of resisting the passage of smoke and fire. Openings through fire-resistance-rated assemblies shall be protected by self- or automatic-closing doors of approved construction meeting the fire protection requirements for the assembly.

903.2.11.1 Opening dimensions and access. Openings shall have a minimum dimension of not less than 30 inches (762 mm). Such openings shall be accessible to have access for the fire department from the exterior and shall not be obstructed in a manner such that fire fighting or rescue cannot be accomplished from the exterior.

903.2.11.2 Rubbish and linen chutes. An automatic sprinkler system shall be installed at the top of rubbish and linen chutes and in their terminal rooms. Chutes shall have additional sprinkler heads installed at alternate floors and at the lowest intake. Where a rubbish chute extends through a building more than one floor below the lowest intake, the extension shall have sprinklers installed that are recessed from the drop area of the chute and protected from freezing in accordance with Section 903.3.1.1. Such sprinklers shall be installed at alternate floors beginning with the second level below the last intake and ending with the floor above the discharge. Chute sprinklers shall be accessible have access for servicing.

904.12.4 Special provisions for automatic sprinkler systems. Automatic sprinkler systems protecting commercial-type cooking equipment shall be supplied from a separate, readily accessible, indicating-type control valve that is identified.

905.2 Location of Class II standpipe hose connections. Class II standpipe hose connections shall be accessible have access and shall be located so that all portions of the building are within 30 feet (9144 mm) of a nozzle attached to 100 feet (30 480 mm) of hose.

906.5 Conspicuous location. Portable fire extinguishers shall be located in conspicuous locations where they will be readily accessible have ready access and be immediately available for use. These locations shall be along normal paths of travel, unless the fire code official determines that the hazard posed indicates the need for placement away from normal paths of travel.

907.2 Where required—new buildings and structures. An approved fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through 907.2.23 and provide occupant notification in accordance with Section 907.5, unless other requirements are provided.
by another section of this code.

Not fewer than one manual fire alarm box shall be provided in an approved location to initiate a fire alarm signal for fire alarm systems employing automatic fire detectors or waterflow detection devices. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, a single fire alarm box shall be installed.

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

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

Exceptions:
1. Manual fire alarm boxes in sleeping units of Group I-1 and I-2 occupancies shall not be required at exits if located at all care providers' control stations or other constantly attended staff locations, provided such stations are visible and continuously available for access and that the distances of travel required in Section 907.4.2.1 are not exceeded.
2. Occupant notification systems are not required to be activated where private mode signaling installed in accordance with NFPA 72 is approved by the fire code official and staff evacuation responsibilities are included in the fire safety and evacuation plan required by Section 404.

907.2.6.3.3 Automatic smoke detection system. An automatic smoke detection system shall be installed throughout resident housing areas, including sleeping units and contiguous day rooms, group activity spaces and other common spaces normally accessible open to residents.

Exceptions:
1. Other approved smoke detection arrangements providing equivalent protection, including, but not limited to, placing detectors in exhaust ducts from cells or behind protective guards listed for the purpose, are allowed when necessary to prevent damage or tampering.
2. Sleeping units in Use Conditions 2 and 3 as described in Section 308 of the International Building Code.
3. Smoke detectors are not required in sleeping units with four or fewer occupants in smoke compartments that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

907.2.10.1 Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-4 occupancies.

Exceptions:
1. A manual fire alarm system is not required in buildings not more than two stories in height where all individual sleeping units and contiguous attic and crawl spaces to those units are separated from each other and public or common areas by not less than 1-hour fire partitions and each individual sleeping unit has an exit directly to a public way, egress court or yard.
2. Manual fire alarm boxes are not required throughout the building where all of the following conditions are met:
   2.1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
   2.2. The notification appliances will activate upon sprinkler water flow.
   2.3. Not fewer than one manual fire alarm box is installed at an approved location.
   2.4. Manual fire alarm boxes in resident or patient sleeping areas shall not be required at exits where located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously available for access and that the distances of travel required in Section 907.4.2.1 are not exceeded.

907.2.20 Covered and open mall buildings. Where the total floor area exceeds 50,000 square feet (4645 m²) within either a covered mall building or within the perimeter line of an open mall building, an emergency voice/alarm communication system shall be provided. Emergency voice/alarm communication systems serving a mall, required or otherwise, shall have access for the fire department. The system shall be provided in accordance with Section 907.5.2.2.

907.2.22.2 Other airport traffic control towers. Airport traffic control towers with a single exit or where sprinklers are not installed throughout shall be provided with smoke detectors in all of the following locations:
1. Airport traffic control cab.
2. Electrical and mechanical equipment rooms.
3. Airport terminal radar and electronics rooms.
4. Office spaces incidental to the tower operation.
5. Lounges for employees, including sanitary facilities.
7. Accessible utility shafts.
8. Utility shafts with access.

907.4.2.6 Unobstructed and unobscured. Manual fire alarm boxes shall be accessible, unobstructed, unobscured and visible at all times.

907.8.2 Testing. Testing shall be performed in accordance with the schedules in NFPA 72 or more frequently where required by the fire code official. Records of testing shall be maintained.

Exception: Devices or equipment that are inaccessible, not available for access for safety considerations shall be tested during scheduled shutdowns where approved by the fire code official, but not less than every 18 months.

909.12.4 Automatic control. Where completely automatic control is required or used, the automatic-control sequences shall be initiated from an appropriately zoned automatic sprinkler system complying with Section 903.3.1.1, manual controls that are readily accessible to have ready access for the fire department and any smoke detectors required by the engineering analysis.

910.4.5 Manual control location. Manual controls shall be located so as to be accessible to have access for the fire service from an exterior door of the building and protected against interior fire exposure by not less than 1-hour fire barriers constructed in accordance with Section 707 of the International Building Code or horizontal assemblies constructed in accordance with Section 711 of the International Building Code, or both.

914.2.3 Emergency voice/alarm communication system. Where the total floor area exceeds 50,000 square feet (4645 m²) within either a covered mall building or within the perimeter line of an open mall building, an emergency voice/alarm communication system shall be provided. Emergency voice/alarm communication systems serving a mall, required or otherwise, shall be accessible to have access for the fire department. The system shall be provided in accordance with Section 907.5.2.2.

1105.9 Group I-2 automatic fire alarm system. An automatic fire alarm system shall be installed in existing Group I-2 occupancies in accordance with Section 907.2.6.2.

Exception: Manual fire alarm boxes in patient sleeping areas shall not be required at exits if located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible open for access and that travel distances required in Section 907.4.2.1 are not exceeded.

2005.4 On aircraft fuel-servicing tank vehicles. Aircraft fuel-servicing tank vehicles shall be equipped with not less than two listed portable fire extinguishers complying with Section 906, each having a minimum rating of 20-B:C. A portable fire extinguisher shall be readily accessible provided with ready access from either side of the vehicle.

2005.7 Fire extinguisher access. Portable fire extinguishers required by this chapter shall be accessible have access at all times. Where necessary, provisions shall be made to clear accumulations of snow, ice and other forms of weather-induced obstructions.

2005.7.1 Cabinets. Cabinets and enclosed compartments used to house portable fire extinguishers shall be clearly marked with the words FIRE EXTINGUISHER in letters not less than 2 inches (51 mm) high. Cabinets and compartments shall be readily accessible provided with ready access at all times.

2006.6.1 Accessibility. Emergency fuel shutoff controls shall be readily accessible provided with ready access at all times when the fueling system is being operated.

2301.1 Scope. Automotive motor fuel-dispensing facilities, marine motor fuel-dispensing facilities, fleet vehicle motor fuel-dispensing facilities, aircraft motor-vehicle fuel-dispensing facilities and repair garages shall be in accordance with this chapter and the International Building Code, International Fuel Gas Code and International Mechanical Code. Such operations shall include both those that are accessible open to the public and private operations.

2303.2 Emergency disconnect switches. An approved, clearly identified and readily accessible emergency disconnect switch with ready access shall be provided at an approved location to stop the transfer of fuel to the fuel dispensers in the event of a fuel spill or other emergency. The emergency disconnect switch for exterior fuel dispensers shall be located within 100 feet (30 480 mm) of, but not less than 20 feet (6096 mm) from, the fuel dispensers. For interior fuel-dispensing operations, the emergency disconnect switch shall be installed at an approved location. Such devices shall be distinctly labeled as: EMERGENCY FUEL SHUT OFF. Signs shall be provided in approved locations.

2306.2.5 Portable tanks. Where approved by the fire code official, portable tanks are allowed to be temporarily used in conjunction with the dispensing of Class I, II or III liquids into the fuel tanks of motor vehicles or motorized equipment on premises not normally accessible open to the public. The approval shall include a definite time limit.

2308.6 Valves. Gas piping to equipment shall be provided with a remote, readily accessible manual shutoff valve that is readily accessible.
2310.6.3 Access. Where the pier is accessible to vehicular traffic, an unobstructed roadway to the shore end of the wharf shall be maintained for access by fire apparatus.

2404.3.2.5 Clear space. Spray booths shall be installed so that all parts of the booth are readily accessible for cleaning. A clear space of not less than 3 feet (914 mm) shall be maintained on all sides of the spray booth. This clear space shall be kept free of any storage or combustible construction.

Exceptions:
1. This requirement shall not prohibit locating a spray booth closer than 3 feet (914 mm) to or directly against an interior partition, wall or floor/ceiling assembly that has a fire-resistance rating of not less than 1 hour, provided the spray booth can be adequately maintained and cleaned.
2. This requirement shall not prohibit locating a spray booth closer than 3 feet (914 mm) to an exterior wall or a roof assembly, provided the wall or roof is constructed of noncombustible material and the spray booth can be adequately maintained and cleaned.

2405.3.2 Bottom drains. Dip tanks greater than 500 gallons (1893 L) in liquid capacity shall be equipped with bottom drains that are arranged to automatically and manually drain the tank quickly in the event of a fire unless the viscosity of the liquid at normal atmospheric temperature makes this impractical. Manual operation shall be from a safe, accessible location. Where gravity flow is not practicable, automatic pumps shall be provided. Such drains shall be trapped and discharged to a closed, vented salvage tank or to an approved outside location.

Exception: Dip tanks containing Class IIIIB combustible liquids where the liquids are not heated above room temperature and the process area is protected by automatic sprinklers.

2404.8.1.2 Alarm station location. Not less than one manual fire alarm and emergency system shutdown station shall be readily accessible to have ready access for operating personnel. Where access to this station is likely to involve exposure to danger, an additional station shall be located adjacent to an exit from the area.

2404.7.8.2 Attachment. Ovserspray collection filters shall be readily removable and accessible for cleaning or replacement.

2703.10.1.1 Combustible workstations. A sprinkler head shall be installed within each branch exhaust connection or individual plenums of workstations of combustible construction. The sprinkler head in the exhaust connection or plenum shall be located not more than 2 feet (610 mm) from the point of the duct connection or the connection to the plenum. Where necessary to prevent corrosion, the sprinkler head and connecting piping in the duct shall be coated with approved or listed corrosion-resistant materials. The sprinkler head shall be accessible for periodic inspection.

Exceptions:
1. Approved alternative automatic fire-extinguishing systems are allowed. Activation of such systems shall deactivate the related processing equipment.
2. Process equipment that operates at temperatures exceeding 932°F (500°C) and is provided with automatic shutdown capabilities for hazardous materials.
3. Exhaust ducts 10 inches (254 mm) or less in diameter from flammable gas storage cabinets that are part of a workstation.
4. Ducts listed or approved for use without internal automatic sprinkler protection.

2703.10.4.4.5 Maintenance and inspection. Sprinklers in exhaust ducts shall be accessible for periodic inspection and maintenance.

2903.3 Fire-fighting access. Organic coating manufacturing operations shall be accessible from not less than one side for the purpose of fire control. Approved aisles shall be maintained for the unobstructed movement of personnel and fire suppression equipment.

3201.4 Evacuation plan. Where required by the fire code official, an evacuation plan for areas open to the public accessible areas and a separate set of plans indicating location and width of aisles, location of exits, exit access doors, exit signs, height of storage, and locations of hazardous materials shall be submitted at the time of permit application for review and approval. Following approval of the plans, a copy of the approved plans shall be maintained on the premises in an approved location.

TABLE 3206.2
GENERAL FIRE PROTECTION AND LIFE SAFETY REQUIREMENTS
<table>
<thead>
<tr>
<th>COMMODITY CLASS</th>
<th>SIZE OF HIGH-PILE STORAGE AREA[^a](square feet) (see Sections 3206.2 and 3206.4)</th>
<th>ALL STORAGE AREAS (See Sections 3206, 3207 and 3208)[^b]</th>
<th>SOLID-PILED STORAGE, SHELF STORAGE AND PALLETIZED STORAGE (see Section 3207.3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Automatic fire-extinguishing system (see Section 3206.4)</td>
<td>Fire detection system (see Section 3206.5)</td>
<td>Building access (see Section 3206.6)</td>
</tr>
<tr>
<td></td>
<td>Not Required[^a]</td>
<td>Not Required</td>
<td>Not Required[^e]</td>
</tr>
<tr>
<td>0-500</td>
<td>Not Required[^a]</td>
<td>Not Required</td>
<td>Not Required[^e]</td>
</tr>
<tr>
<td>501-2,500</td>
<td>Open to the Public accessible</td>
<td>Yes</td>
<td>Not Required</td>
</tr>
<tr>
<td>2,501-12,000</td>
<td>Open to the Public accessible</td>
<td>Yes</td>
<td>Not Required</td>
</tr>
<tr>
<td>I-IV</td>
<td>Not open to the public Nonpublic accessible (Option 1)</td>
<td>Yes</td>
<td>Not Required</td>
</tr>
<tr>
<td>2,501-12,000</td>
<td>Not open to the public Nonpublic accessible (Option 2)</td>
<td>Not Required[^a]</td>
<td>Yes</td>
</tr>
<tr>
<td>12,001-20,000</td>
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<td>Not Required</td>
<td>Yes</td>
</tr>
<tr>
<td>20,001-500,000</td>
<td>Yes</td>
<td>Not Required</td>
<td>Yes</td>
</tr>
<tr>
<td>Greater than 500,001[^g]</td>
<td>Yes</td>
<td>Not Required</td>
<td>Yes</td>
</tr>
<tr>
<td>0-500</td>
<td>Not Required[^a]</td>
<td>Not Required</td>
<td>Not Required[^e]</td>
</tr>
<tr>
<td>501-2,500</td>
<td>Open to the Public accessible</td>
<td>Yes</td>
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</tr>
<tr>
<td>501-2,500</td>
<td>Not open to the public Nonpublic accessible (Option 1)</td>
<td>Yes</td>
<td>Not Required</td>
</tr>
<tr>
<td>501-2,500</td>
<td>Not open to the public Nonpublic accessible (Option 2)</td>
<td>Not Required[^a]</td>
<td>Yes</td>
</tr>
<tr>
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<td>Not Required</td>
<td>Yes</td>
</tr>
<tr>
<td>300,001-500,000[^[h]]</td>
<td>Yes</td>
<td>Not Required</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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

a. Where automatic sprinklers are required for reasons other than those in Chapter 32, the portion of the sprinkler system protecting the high-piled storage area shall be designed and installed in accordance with Sections 3207 and 3208.

b. For aisles, see Section 3206.9.

c. Piles shall be separated by aisles complying with Section 3206.9.

d. For storage in excess of the height indicated, special fire protection shall be provided in accordance with Note g where required by the fire code official. See Chapters 51 and 57 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 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 Section 706 the International Building Code shall be used to divide high-piled storage exceeding 500,000 square feet in area.

i. Not required where an automatic fire-extinguishing system is designed and installed to protect the high-piled storage area in accordance with Sections 3207 and 3208.

j. Not required where storage areas are protected by either early suppression fast response (ESFR) sprinkler systems or control mode special application sprinklers with a response time index of 50 (m • s)²/s or less that are listed to control a fire in the stored commodities with 12 or fewer sprinklers, installed in accordance with NFPA 13.

### 3206.1 Access doors

Where building access is required by Table 3206.2, fire department access doors shall be provided in accordance with this section. Access doors shall be accessible, reachable without the use of a ladder.

#### 3206.9.1.1 Sprinklered buildings

Aisles in sprinklered buildings shall be not less than 44 inches (1118 mm) wide. Aisles shall be not less than 96 inches (2438 mm) wide in high-piled storage areas exceeding 2,500 square feet (232 m²) in area, that are accessible to the public and designated to contain high-hazard commodities.

**Exception:** Aisles in high-piled storage areas exceeding 2,500 square feet (232 m²) in area, that are accessible, open to the public and designated to contain high-hazard commodities, are protected by a sprinkler system designed for multiple-row racks of high-hazard commodities shall be not less than 44 inches (1118 mm) wide.

Aisles shall be not less than 96 inches (2438 mm) wide in areas accessible, open to the public where mechanical stocking methods are used.

#### 3309.1 Emergency telephone

**Emergency** telephone facilities with ready access shall be provided in an approved location at the construction site. The street address of the construction site and the emergency telephone number of the fire department shall be posted adjacent to the telephone.

**3313.1 Where required.** In buildings required to have standpipes by Section 905.3.1, not less than one standpipe shall be provided for use during construction. Such standpipes shall be installed prior to construction exceeding 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access. Such standpipe shall be provided with fire department hose connections at accessible locations adjacent to usable stairways. Such standpipes shall be extended as construction progresses to within one floor of the highest point of construction having secured decking or floor.

#### 3503.6 Signage

Visible hazard identification signs shall be provided where required by Chapter 50. Where the hot work area is accessible, open to persons other than the operator of the hot work equipment, conspicuous signs shall be posted to warn others before they enter the hot work area. Such signs shall display the following warning:

CAUTION HOT WORK IN PROGRESS STAY CLEAR

#### 3504.2.6 Fire extinguisher

Not less than one portable fire extinguisher complying with Section 906 and with a minimum 2-A:20-B:C rating shall be readily accessible, provided with ready access within 30 feet (9144 mm) of the location where hot work is performed.

#### 5003.2.2.1 Design and construction

Piping, tubing, valves, fittings and related components used for hazardous materials shall be in accordance with the following:

1. Piping, tubing, valves, fittings and related components shall be designed and fabricated from materials that are compatible with the material to be contained and shall be of adequate strength and durability to withstand the pressure, structural and seismic stress and exposure to which they are subject.

2. Piping and tubing shall be identified in accordance with ASME A13.1 to indicate the material conveyed.

3. **Readily accessible manual** control valves or automatic remotely activated fail-safe emergency shutoff valves shall be installed with ready access on supply piping and tubing at the following locations:
   3.1. The point of use.
   3.2. The tank, cylinder or bulk source.

4. Manual emergency shutoff valves and controls for remotely activated emergency shutoff valves shall be identified and the location shall have access be clearly visible, accessible and indicated by means of a sign.

5. Backflow prevention or check valves shall be provided where the backflow of hazardous materials could create a hazardous condition or cause the unauthorized discharge of hazardous materials.

6. Where gases or liquids having a hazard ranking of:

   Health Class 3 or 4
   Flammability Class 4
   Instability Class 3 or 4

   in accordance with NFPA 704 are carried in pressurized piping above 15 pounds per square inch gauge (psig) (103 kPa), an approved means of leak detection and emergency shutoff or excess flow control shall be provided. Where the piping originates from within a hazardous material storage room or area, the excess flow control shall be located within the storage room or area. Where the piping originates from a bulk source, the excess flow control shall be located as close to the bulk source as practical.
Exceptions:
1. Piping for inlet connections designed to prevent backflow.
2. Piping for pressure relief devices.

5004.2.3 Containment pallets. Where used as an alternative to spill control and secondary containment for outdoor storage in accordance with the exception in Section 5004.2, containment pallets shall comply with all of the following:
   1. A liquid-tight sump accessible with access for visual inspection shall be provided.
   2. The sump shall be designed to contain not less than 66 gallons (250 L).
   3. Exposed surfaces shall be compatible with material stored.
   4. Containment pallets shall be protected to prevent collection of rainwater within the sump.

5303.5 Securing compressed gas containers, cylinders and tanks. Compressed gas containers, cylinders and tanks shall be secured to prevent falling caused by contact, vibration or seismic activity. Securing of compressed gas containers, cylinders and tanks shall be by one of the following methods:
   1. Securing containers, cylinders and tanks to a fixed object with one or more restraints.
   2. Securing containers, cylinders and tanks on a cart or other mobile device designed for the movement of compressed gas containers, cylinders or tanks.
   3. Nesting of compressed gas containers, cylinders and tanks at container filling or servicing facilities or in sellers' warehouses not accessible open to the public. Nesting shall be allowed provided the nested containers, cylinders or tanks, if dislodged, do not obstruct the required means of egress.
   4. Securing of compressed gas containers, cylinders and tanks to or within a rack, framework, cabinet or similar assembly designed for such use.

   Exception: Compressed gas containers, cylinders and tanks in the process of examination, filling, transport or servicing.

5305.4 Valves. Valves utilized on compressed gas systems shall be suitable for the use intended and shall be accessible in a location with access. Valve handles or operators for required shutoff valves shall not be removed or otherwise altered to prevent access.

5503.4.3 Identification of containers. Stationary containers shall be identified with the manufacturing specification and maximum allowable working pressure with a permanent nameplate. The nameplate shall be installed on the container in an accessible a location with access. The nameplate shall be marked in accordance with the ASME Boiler and Pressure Vessel Code or DOTn 49 CFR Parts 100-185.

5606.5.2 Smokeless propellant. Commercial stocks of smokeless propellants shall be stored as follows:
1. Quantities exceeding 20 pounds (9 kg), but not exceeding 100 pounds (45 kg) shall be stored in portable wooden boxes having walls of not less than 1 inch (25 mm) nominal thickness.
2. Quantities exceeding 100 pounds (45 kg), but not exceeding 800 pounds (363 kg), shall be stored in nonportable storage cabinets having walls not less than 1 inch (25 mm) nominal thickness. Not more than 400 pounds (182 kg) shall be stored in any one cabinet, and cabinets shall be separated by a distance of not less than 25 feet (7620 mm) or by a fire partition having a fire-resistance rating of not less than 1 hour.
3. Storage of quantities exceeding 800 pounds (363 kg), but not exceeding 5,000 pounds (2270 kg) in a building shall comply with all of the following:
   3.1. The warehouse or storage room is inaccessible, not open to unauthorized personnel.
   3.2. Smokeless propellant shall be stored in nonportable storage cabinets having wood walls not less than 1 inch (25 mm) nominal thickness and having shelves with not more than 3 feet (914 mm) of separation between shelves.
   3.3. Not more than 400 pounds (182 kg) is stored in any one cabinet.
   3.4. Cabinets shall be located against walls of the storage room or warehouse with not less than 40 feet (12 192 mm) between cabinets.
   3.5. The minimum required separation between cabinets shall be 20 feet (6096 mm) provided that barricades twice the height of the cabinets are attached to the wall, midway between each cabinet. The barricades must extend not less than 10 feet (3048 mm) outward, be firmly attached to the wall and be constructed of steel not less than \( \frac{1}{4} \) inch thick (6.4 mm), 2-inch (51 mm) nominal thickness wood, brick or concrete block.
   3.6. Smokeless propellant shall be separated from materials classified as combustible liquids, flammable liquids, flammable solids or oxidizing materials by a distance of 25 feet (7620 mm) or by a fire partition having a fire-resistance rating of 1 hour.
   3.7. The building shall be equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

   4. Smokeless propellants not stored in accordance with Item 1, 2, or 3 above shall be stored in a Type 2 or 4 magazine in accordance with Section 5604 and NFPA 495.
5606.5.2.3 Small arms primers. Commercial stocks of small arms primers shall be stored as follows:

1. Quantities not to exceed 750,000 small arms primers stored in a building shall be arranged such that not more than 100,000 small arms primers are stored in any one pile and piles are not less than 15 feet (4572 mm) apart.

2. Quantities exceeding 750,000 small arms primers stored in a building shall comply with all of the following:
   1. The warehouse or storage building shall not be accessible to unauthorized personnel.
   2. Small arms primers shall be stored in cabinets. Not more than 200,000 small arms primers shall be stored in any one cabinet.
   3. Shelves in cabinets shall have vertical separation of not less than 2 feet (610 mm).
   4. Cabinets shall be located against walls of the warehouse or storage room with not less than 40 feet (12 192 mm) between cabinets. The minimum required separation between cabinets shall be allowed to be reduced to 20 feet (6096 mm) provided that barricades twice the height of the cabinets are attached to the wall, midway between each cabinet. The barricades shall be firmly attached to the wall and shall be constructed of steel not less than 1/4 inch thick (6.4 mm), 2-inch (51 mm) nominal thickness wood, brick or concrete block.
   5. Small arms primers shall be separated from materials classified as combustible liquids, flammable liquids, flammable solids or oxidizing materials by a distance of 25 feet (7620 mm) by a fire partition having a fire-resistance rating of 1 hour.

3. Small arms primers not stored in accordance with Item 1 or 2 of this section shall be stored in a magazine meeting the requirements of Section 5604 and NFPA 495.

5703.6.2.1 Special materials. Low-melting-point materials (such as aluminum, copper or brass), materials that soften on fire exposure (such as nonmetallic materials) and nonductile material (such as cast iron) shall be acceptable for use underground in accordance with the applicable standard listed in Table 5703.6.2. Where such materials are used outdoors in above-ground piping systems or within buildings, they shall be in accordance with the applicable standard listed in Table 5703.6.2 and one of the following:

1. Suitably protected against fire exposure.
2. Located where leakage from failure would not unduly expose people or structures.
3. Located where leakage can be readily controlled by operation of accessible remotely located valves in a location with access.

In all cases, nonmetallic piping shall be used in accordance with Section 27.4.6 of NFPA 30.

5703.6.6.1 Backflow protections. Connections to pipelines or piping by which equipment (such as tank cars, tank vehicles or marine vessels) discharges liquids into storage tanks shall be provided with check valves or block valves for automatic protection against backflow where the piping arrangement is such that backflow from the system is possible. Where loading and unloading is done through a common pipe system, a check valve is not required. However, a block valve, located so as to be readily accessible, with ready access or remotely operable, shall be provided.

5704.2.9.6.2 Separation between adjacent stable or unstable liquid tanks. The separation between tanks containing stable liquids shall be in accordance with Table 22.4.2.1 of NFPA 30. Where tanks are in a diked area containing Class I or II liquids, or in the drainage path of Class I or II liquids, and are compacted in three or more rows or in an irregular pattern, the fire code official is authorized to require greater separation than specified in Table 22.4.2.1 of NFPA 30 or other means to make tanks in the interior of the pattern accessible, open for fire-fighting purposes.

Exception: Tanks used for storing Class IIIB liquids are allowed to be spaced 3 feet (914 mm) apart unless within a diked area or drainage path for a tank storing Class I or II liquids.

The separation between tanks containing unstable liquids shall be not less than one-half the sum of their diameters.

5704.2.9.7.5.1 Information signs. A permanent sign shall be provided at the fill point for the tank, documenting the filling procedure and the tank calibration chart.

Exception: Where climatic conditions are such that the sign may be obscured by ice or snow, or weathered beyond readability or otherwise impaired, said procedures and chart shall be located in the office window, lock box or other area accessible, open to the person filling the tank.

5704.3.5.4 Combustible materials. In areas that are inaccessible, not open to the public, Class I, II and IIIA liquids shall not be stored in the same pile or rack section as ordinary combustible commodities unless such materials are packaged together as kits.

5704.3.6.2 Container capacity. Containers for Class I liquids shall not exceed a capacity of 5 gallons (19 L).

Exception: Metal containers not exceeding 55 gallons (208 L) are allowed to store up to 240 gallons (908 L) of the maximum allowable quantity per control area of Class IB and IC liquids in a control area. The building shall be equipped throughout with an approved automatic sprinkler system in accordance with Table 5704.3.4.1. The containers shall be
provided with plastic caps without cap seals and shall be stored upright. Containers shall not be stacked or stored in racks and shall not be located in areas accessible to the public.

5706.4.7.6 Piping, valves and fittings. Piping valves and fittings shall be in accordance with Section 5703.6 except as modified by the following:

1. Flexibility of piping shall be ensured by appropriate layout and arrangement of piping supports so that motion of the wharf structure resulting from wave action, currents, tides or the mooring of vessels will not subject the pipe to repeated excessive strain.
2. Pipe joints that depend on the friction characteristics of combustible materials or on the grooving of pipe ends for mechanical continuity of piping shall not be used.
3. Swivel joints are allowed in piping to which hoses are connected and for articulated, swivel-joint transfer systems, provided the design is such that the mechanical strength of the joint will not be impaired if the packing materials fail such as by exposure to fire.
4. Each line conveying Class I or II liquids leading to a wharf shall be provided with a readily accessible block valve located with ready access and on shore near the approach to the wharf and outside of any diked area. Where more than one line is involved, the valves shall be grouped in one location.
5. Means shall be provided for easy access to cargo line valves located below the wharf deck.
6. Piping systems shall contain a sufficient number of valves to operate the system properly and to control the flow of liquid in normal operation and in the event of physical damage.
7. Piping on wharves shall be bonded and grounded where Class I and II liquids are transported. Where excessive stray currents are encountered, insulating joints shall be installed. Bonding and grounding connections on piping shall be located on the wharf side of hose riser insulating flanges, where used, and shall be accessible in a location with ready access for inspection.
8. Hose or articulated swivel-joint pipe connections used for cargo transfer shall be capable of accommodating the combined effects of change in draft and maximum tidal range, and mooring lines shall be kept adjusted to prevent surge of the vessel from placing stress on the cargo transfer system.
9. Hoses shall be supported to avoid kinking and damage from chafing.

5706.4.10.4 Fire apparatus access. Where the wharf is accessible to vehicular traffic, an unobstructed fire apparatus access road to the shore end of the wharf shall be maintained in accordance with Chapter 5.

5706.5.3.1.1 Shutoff valves. Approved automatically or manually activated shutoff valves shall be provided where the transfer hose connects to the process piping, and on both sides of any exterior fire-resistance-rated wall through which the piping passes. Manual shutoff valves shall be arranged so that they are accessible, have access from grade. Valves shall not be locked in the open position.

5706.5.4.5 Commercial, industrial, governmental or manufacturing. Dispensing of Class II and III motor vehicle fuel from tank vehicles into the fuel tanks of motor vehicles located at commercial, industrial, governmental or manufacturing establishments is allowed where permitted, provided such dispensing operations are conducted in accordance with the following:

1. Dispensing shall occur only at sites that have been issued a permit to conduct mobile fueling.
2. The owner of a mobile fueling operation shall provide to the jurisdiction a written response plan which demonstrates readiness to respond to a fuel spill and carry out appropriate mitigation measures, and describes the process to dispose properly of contaminated materials.
3. A detailed site plan shall be submitted with each application for a permit. The site plan shall indicate: all buildings, structures and appurtenances on site and their use or function; all uses adjacent to the lot lines of the site; the locations of allstorm drain openings, adjacent waterways or wetlands; information regarding slope, natural drainage, curbing, impounding and how a spill will be retained upon the site property; and the scale of the site plan. Provisions shall be made to prevent liquids spilled during dispensing operations from flowing into buildings or off-site. Acceptable methods include, but shall not be limited to, grading driveways, raising doorsills or other approved means.
4. The fire code official is allowed to impose limits on the times and days during which mobile fueling operations is allowed to take place, and specific locations on a site where fueling is permitted.
5. Mobile fueling operations shall be conducted in areas not accessible to the public or shall be limited to times when the public is not present.
6. Mobile fueling shall not take place within 15 feet (4572 mm) of buildings, property lines, combustible storage or storm drains.

Exceptions:

1. The distance to storm drains shall not apply where an approved storm drain cover or an approved equivalent that will prevent any fuel from reaching the drain is in place prior to fueling or a fueling hose being placed within 15 feet (4572 mm) of the drain. Where placement of a storm drain cover will cause the accumulation of excessive water or difficulty in conducting the fueling, such cover shall not be used and
the fueling shall not take place within 15 feet (4572 mm) of a drain.

2. The distance to storm drains shall not apply for drains that direct influent to approved oil interceptors.

9. The tank vehicle shall comply with the requirements of NFPA 385 and local, state and federal requirements. The tank vehicle’s specific functions shall include that of supplying fuel to motor vehicle fuel tanks. The vehicle and all its equipment shall be maintained in good repair.

10. Signs prohibiting smoking or open flames within 25 feet (7620 mm) of the tank vehicle or the point of fueling shall be prominently posted on three sides of the vehicle including the back and both sides.

11. A portable fire extinguisher with a minimum rating of 40:BC shall be provided on the vehicle with signage clearly indicating its location.

12. The dispensing nozzles and hoses shall be of an approved and listed type.

13. The dispensing hose shall not be extended from the reel more than 100 feet (30 480 mm) in length.

14. Absorbent materials, nonwater-absorbent pads, a 10-foot-long (3048 mm) containment boom, an approved container with lid and a nonmetallic shovel shall be provided to mitigate a minimum 5-gallon (19 L) fuel spill.

15. Tank vehicles shall be equipped with a “fuel limit” switch such as a count-back switch, to limit the amount of a single fueling operation to not more than 500 gallons (1893 L) before resetting the limit switch.

**Exception:** Tank vehicles where the operator carries and can utilize a remote emergency shutoff device which, when activated, immediately causes flow of fuel from the tank vehicle to cease.

16. Persons responsible for dispensing operations shall be trained in the appropriate mitigating actions in the event of a fire, leak or spill. Training records shall be maintained by the dispensing company.

17. Operators of tank vehicles used for mobile fueling operations shall have in their possession at all times an emergency communications device to notify the proper authorities in the event of an emergency.

18. The tank vehicle dispensing equipment shall be constantly attended and operated only by designated personnel who are trained to handle and dispense motor fuels.

19. Fuel dispensing shall be prohibited within 25 feet (7620 mm) of any source of ignition.

20. The engines of vehicles being fueled shall be shut off during dispensing operations.

21. Nighttime fueling operations shall only take place in adequately lighted areas.

22. The tank vehicle shall be positioned with respect to vehicles being fueled to prevent traffic from driving over the delivery hose.

23. During fueling operations, tank vehicle brakes shall be set, chock blocks shall be in place and warning lights shall be in operation.

24. Motor vehicle fuel tanks shall not be topped off.

25. The dispensing hose shall be properly placed on an approved reel or in an approved compartment prior to moving the tank vehicle.

26. The fire code official and other appropriate authorities shall be notified when a reportable spill or unauthorized discharge occurs.

27. Operators shall place a drip pan or an absorbent pillow under each fuel fill opening prior to and during dispensing operations. Drip pans shall be liquid-tight. The pan or absorbent pillow shall have a capacity of not less than 3 gallons (11.36 L). Spills retained in the drip pan or absorbent pillow need not be reported. Operators, when fueling, shall have on their person an absorbent pad capable of capturing diesel fuel overfills. Except during fueling, the nozzle shall face upward and an absorbent pad shall be kept under the nozzle to catch drips. Contaminated absorbent pads or pillows shall be disposed of regularly in accordance with local, state and federal requirements.

**6004.2.2.10.3 Shut off of gas supply.** The gas-detection system shall automatically close the shutoff valve at the source on gas supply piping and tubing related to the system being monitored for whichever gas is detected.

**Exception:** Automatic shutdown is not required for reactors utilized for the production of highly toxic or toxic compressed gases where such reactors are:

1. Operated at pressures less than 15 pounds per square inch gauge (psig) (103.4 kPa).
2. Constantly attended.
3. Provided with readily accessible emergency shutoff valves.
4. Provided with emergency shutoff valves with ready access.

**6109.9 Storage within buildings accessible open to the public.** Department of Transportation (DOTn) specification cylinders with maximum water capacity of 2 1/2 pounds (1 kg) used in completely self-contained hand torches and similar applications are allowed to be stored or displayed in a building accessible open to the public. The quantity of LP-gas shall not exceed 200 pounds (91 kg) except as provided in Section 6109.11.

**6109.10 Storage within buildings not accessible open to the public.** The maximum quantity allowed in one storage location in buildings not accessible open to the public, such as industrial buildings, shall not exceed a water capacity of 735 pounds (334 kg) [nominal 300 pounds (136 kg) of LP-gas]. Where additional storage locations are required on the same floor within the same building, they shall be separated by not less than 300 feet (91 440 mm). Storage beyond these limitations shall comply with Section 6109.11.
6109.15 LP-gas cylinder exchange for resale. In addition to other applicable requirements of this chapter, facilities operating LP-gas cylinder exchange stations that are accessible to the public shall comply with the following requirements.

1. Cylinders shall be secured in a lockable, ventilated metal cabinet or other approved enclosure.
2. Cylinders shall be accessible, available only by authorized personnel or by use of an automated exchange system in accordance with Section 6109.15.1.
3. A sign shall be posted on the entry door of the business operating the cylinder exchange stating "DO NOT BRING LP-GAS CYLINDERS INTO THE BUILDING" or similar approved wording.
4. An emergency contact information sign shall be posted within 10 feet (3048 mm) of the cylinder storage cabinet. The content, lettering, size, color and location of the required sign shall be as required by the fire code official.

D102.1 Access and loading. Facilities, buildings or portions of buildings hereafter constructed shall be accessible to fire department apparatus by way of an approved fire apparatus access road with an asphalt, concrete or other approved driving surface capable of supporting the imposed load of fire apparatus weighing at least 75,000 pounds (34 050 kg).

I101.3 Noncompliant conditions requiring component repair or replacement. The following shall be deemed noncompliant conditions and shall cause the related component(s) to be repaired or replaced to comply with the provisions of this code:

1. Sprinkler and standpipe system piping and fittings having any of the following conditions:
   1.1. Signs of leakage.
   1.2. Evidence of corrosion.
   1.3. Misalignment.
   1.4. Mechanical damage.
2. Sprinkler piping support having any of the following conditions:
   2.1. Materials resting on or hung from sprinkler piping.
   2.2. Damaged or loose hangers or braces.
3. Class II and Class III standpipe systems having any of the following conditions:
   3.1. No hose or nozzle, where required.
   3.2. Hose threads incompatible with fire department hose threads.
   3.3. Hose connection cap missing.
   3.4. Mildew, cuts, abrasions and deterioration evident.
   3.5. Coupling damaged.
   3.6. Gaskets missing or deteriorated.
   3.7. Nozzle missing or obstructed.
4. Hose racks and cabinets having any of the following conditions:
   4.1. Difficult to operate or damaged.
   4.2. Hose improperly racked or rolled.
   4.3. Inability of rack to swing 90 degrees (1.57 rad) out of the cabinet.
   4.4. Cabinet locked, except as permitted by this code.
   4.5. Cabinet door will not fully open.
   4.6. Door glazing cracked or broken.
5. Portable fire extinguishers having any of the following conditions:
   5.1. Broken seal or tamper indicator.
   5.2. Expired maintenance tag.
   5.3. Pressure gauge indicator in "red."
   5.4. Signs of leakage or corrosion.
   5.5. Mechanical damage, denting or abrasion of tank.
   5.6. Presence of repairs such as welding, soldering or brazing.
   5.7. Damaged threads.
   5.8. Damaged hose assembly, couplings or swivel joints.
6. Fire alarm and detection control equipment, initiating devices and notification appliances having any of the following conditions:
   6.1. Corroded or leaking batteries or terminals.
   6.2. Smoke detectors having paint or other ornamentation that is not factory-applied.
   6.3. Mechanical damage to heat or smoke detectors.
   6.4. Tripped fuses.
7. Fire department connections having any of the following conditions:
   7.1. Fire department connections are not visible or accessible, available for access from the fire apparatus access road.
Fire pumps having any of the following conditions:

8.1. Pump room temperature is less than 40°F (4.4°C).
8.2. Ventilating louvers are not freely operable.
8.3. Corroded or leaking system piping.
8.4. Diesel fuel tank is less than two-thirds full.
8.5. Battery readings, lubrication oil or cooling water levels are abnormal.

L104.6 Isolation valves. System isolation valves that are accessible to available for access by the fire department shall be installed on the system riser to allow piping beyond any air cylinder refill panel to be blocked.

L104.14.1 Location. The location of the external mobile air connection shall be accessible to available for access by mobile air apparatus and approved by the fire chief.

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[A] 109.1.1 General. Construction or work for which a permit is required by this code shall be subject to inspection by the code official and such construction or work shall remain accessible, open for access and exposed for inspection purposes until approved by the code official.

It shall be the duty of the permit applicant to cause the work to remain accessible, open for access and exposed for inspection purposes. Neither the code official nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid.

Where required by the code official, a survey of the lot shall be provided to verify that the mitigation features are provided and the building or structure is located in accordance with the approved plans.

403.1 Restricted access. Where emergency vehicle access is restricted because of secured access roads or driveways or where immediate access is necessary for life-saving or fire-fighting purposes, the code official is authorized to require a key box to be installed in an accessible, a location with access. The key box shall be of a type approved by the code official and shall contain keys to gain necessary access as required by the code official.

ALTERNATIVE CONCEPTS

This appendix chapter provides consideration of the following alternatives: (1) exterior sprinkler systems, (2) alternative water supply systems for exposure protection, (3) Class A foam systems, (4) enhanced exterior fire protection, (5) sheltering in place, and (6) building location.

Exterior sprinkler systems. Currently, there is no nationally accepted standard for the design and installation of exterior fire sprinkler systems. Interior sprinkler systems are regulated by nationally recognized standards that have specific requirements. However, exterior sprinkler systems lack such uniformity. What is generally proposed is a type of sprinkler system, placed on the roofs or eaves of a building, whose primary purpose is to wet down the roof. These types of systems can be activated either manually or automatically. However, the contemporary thought on exterior sprinkler systems is that if the roof classification is of sufficient fire resistance, exterior sprinklers are of little or no value.

Another option and alternative with exterior sprinklers is to use them to improve the relative humidity and fuel moisture in the defensible space. In this case, the exterior sprinkler is not used to protect the structure as much as it attempts to alter the fuel situation. However, studies do not support the idea that merely spraying water into the air in the immediate vicinity of a rapidly advancing wildland-urban fire does much good. Clearly, irrigation systems that keep plants healthy and fire-resistive plants that resist convection and radiated heat can accomplish the same purpose.

Alternative water supply systems for exposure protection. Pools and spas are often offered as an alternative water source for fire departments. These water sources must be accessible, open for access and reliable to be of any use by fire protection forces. Accessibility means that the fire department must be able to withdraw the water without having to go through extraordinary measures such as knocking down fences or having to set up drafting situations. Designs have been created to put liquid- or gas-fueled pumps or gravity valves on pools and spas to allow fire departments to access these water systems. A key vulnerability to the use of these alternative water systems is loss of electrical power. When the reliability of a water system depends on external power sources, it cannot be relied upon by fire fighters to be available in a worstcase scenario.

Class A foam systems. A new and emerging technology is the concept of Class A foam devices. These are devices that allow a homeowner to literally coat the exterior of their house with a thick layer of foam that prevents the penetration of embers and radiant heat to the structure. There is no nationally recognized standard for Class A foam technology; however, experiments in various wildland fire agencies seem to advocate foaming houses in advance of fire and flame fronts. To be accepted by the
code official, the Class A foam system should pass rigorous scrutiny with regard to the manner and needs in which it is activated, the ways and means in which it is properly maintained, and a ways and means to test the system for its operational readiness during hiatus between emergencies.

**Enhanced exterior fire protection.** This alternative method would increase the degree of fire resistance on the exterior of a building. This is most often an alternative recommended as a retroactive application when individual properties cannot achieve adequate **defensible space** on the exterior of a building. Normally, fire resistance and building scenarios are concerned with containing a fire. Fire-resistance ratings within building design infers resistance to a fire for the specified time to compartmentalize the building's interior.

To improve fire resistance on the exterior of the structure, the primary emphasis is on preventing intrusion into the building. This means protection of apertures and openings that may or may not be required to have any degree of fire resistance by accepted building codes. The option that is available here is for individuals to provide coverage in the form of shutters or closures to these areas, which, along with maintenance of perimeter-free combustibles, can often prevent intrusion.

There are obvious limitations to this alternative. First and foremost is the means of adequately evaluating the proposed fire resistance of any given assembly. Testing techniques to determine fire resistance for such objects as drywall and other forms of construction may not be applicable to exterior application. Nonetheless, code officials should determine the utility of a specific fire resistance proposal by extrapolating conservatively.

**Shelter in place.** Developments in the wildland-urban interface may be designed to allow occupants to "Shelter in Place." Use of this design alternative should include ignition-resistant construction, access, water supply, automatic sprinkler systems, provisions for and maintenance of **defensible space**, and a Fire Protection Plan.

A Fire Protection Plan describes ways to minimize the fire problems created by a specific project or development. The purpose for the Fire Protection Plan is to reduce the burden and impact of the project or development on the community's fire protection delivery system. The plan may utilize components of land use, building construction, vegetation management and other design techniques and technologies. It should include specific mitigation measures consistent with the unique problems resulting from the location, topography, geology, flammable vegetation and climate of the proposed site. The plan shall be consistent with this code, and approved by the fire code official. The cost of preparation and review is to be borne by the project or development proponent.

**Building location.** The location of a new building within lot lines should be considered as it relates to topography and fire behavior. Buildings located in natural chimneys, such as narrow canyons and saddles, are especially fire prone because winds are funneled into these areas and eddies are created. Buildings located on narrow ridges without setbacks may be subjected to increased flame and convective heat exposure from a fire advancing from below. Stone or masonry walls can act as heat shields and deflect the flames. Swimming pools and rated or **noncombustible** decks and patios can be used to create a setback, decreasing the exposure to the structure. Attic and under floor vents, picture windows and sliding glass doors should not face possible corridors due to the increased risk of flame or ember penetration.

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[F] 513.12.4 Automatic control. Where complete automatic control is required or used, the automatic control sequences shall be initiated from an appropriately zoned automatic sprinkler system complying with Section 903.3.1.1 of the **International Fire Code**, from manual controls that are readily accessible to, with access by the fire department, and any smoke detectors required by engineering analysis.

**Reason:** Coordination with P84-15 which replaced the term 'accessibility' with the clarification of providing access for repair or replacement or open to a location or fire department access. The term 'accessible' is defined in the IBC and relates to elements and facilities that serve or have special accommodations for persons with mobility impairments. The IPC and IMC use the term "Access (to)" or "Ready Access" – see below. This will clarify that the provisions are for access for repair, not accessibility for persons with disabilities.

[M]ACCESS (TO). That which enables a device, appliance or equipment to be reached by ready access or by a means that first requires the removal or movement of a panel, door or similar obstruction [see also "Ready access (to)"].

[M]READY ACCESS (TO). That which enables a device, appliance or equipment to be directly reached, without requiring the removal or movement of any panel, door or similar obstruction [see "Access (to)"].

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)
Cost Impact: Will not increase the cost of construction
This is a change in terminology for clarity and will have not technical changes to the codes.

Public Hearing Results

Committee Action: Disapproved

Committee Reason: This proposal was preferred over F1-16 however there were concerns with how certain sections were addressing the replacement of the term accessible. In particular Sections 106.3 and 605.12 were noted. This proposal needs a more careful review of each section for specific wording to meet the intent.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian representing Fire Code Action Committee (fcac@icc Safe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

105.6.16 Fire hydrants and valves. An operational permit is required to use or operate fire hydrants or valves intended for fire suppression purposes that are installed on water systems and provided with access to a fire apparatus access road that is open to or generally used by the public.

Exception: A permit is not required for authorized employees of the water company that supplies the system or the fire department to use or operate fire hydrants or valves.

[A] 106.3 Concealed work. It shall be the duty of the permit applicant to cause the work to remain open for access and exposed able to be accessed for inspection purposes. Where any installation subject to inspection prior to use is covered or concealed without having first been inspected, the fire code official shall have the authority to require that such work be exposed made visible and able to be accessed for inspection. Neither the fire code official nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

107.5 Rendering equipment inoperative. Portable or fixed fire-extinguishing systems or devices, and fire-warning systems, shall be provided with ready access and shall not be rendered inoperative or not available for access, except as necessary during emergencies, maintenance, repairs, alterations, drills or prescribed testing.

309.2 Battery chargers. Battery chargers shall be of an approved type. Combustible storage shall be kept not less than 3 feet (915 mm) from battery chargers. Battery charging shall not be conducted in areas accessible open to the public.

315.6 Storage in plenums. Storage shall not be permitted in plenums. Abandoned material in plenums shall be deemed to be storage and shall be removed. Where located in plenums, the portion of abandoned cables that is open for access and that are not able to be accessed without causing damage, or requiring demolition to the building, shall be identified for future use with a tag or shall be deemed storage and shall be removed.

316.2.1 Exterior access to shaftways. Outside openings accessible to that can be reached by the fire department and that open directly on a hoistway or shaftway communicating between two or more floors in a building shall be plainly marked with the word SHAFTWAY in red letters not less than 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible from the outside of the building.

504.1 Required access. Exterior doors and openings required by this code or the International Building Code shall be maintained with ready access for emergency access by the fire department. An approved access walkway leading from fire apparatus access roads to exterior openings shall be provided when required by the fire code official.

509.2 Equipment access. Approved access shall be provided and maintained for all fire protection equipment to permit immediate safe operation and maintenance of such equipment. Storage, trash and other materials or objects shall not be placed or kept in such a manner that would prevent access to such equipment from having ready access.

603.1.5 Access. The installation shall have ready access to be provided with access to equipment for cleaning hot surfaces; removing burners; replacing motors, controls, air filters, chimney connectors, draft regulators and other working parts; and for
adjusting, cleaning and lubricating parts.

603.1.6.1 Diagrams. Contractors installing industrial oil-burning systems shall furnish not less than two copies of diagrams showing the main oil lines and controlling valves, one copy of which shall be posted at the oil-burning equipment and another at an approved location that will have access be available in case of emergency.

605.12 Abandoned wiring in plenums. Portions of abandoned Abandoned cables in air-handling plenums that have access shall be removed. Cables plenums that are unused and have not been able to be accessed without causing damage, or requiring demolition to the building, shall be tagged for future use or shall be considered abandoned removed.

606.5 Access. Refrigeration Access to refrigeration systems having a refrigerant circuit containing more than 220 pounds (100 kg) of Group A1 or 30 pounds (14 kg) of any other group refrigerant shall have access be provided for the fire department at all times as required by the fire code official.

608.4.1 Separate rooms. Where stationary batteries are installed in a separate equipment room with access to and only to authorized personnel have access to the room, they shall be permitted to be installed on an open rack for ease of maintenance.

703.1 Maintenance. The required fire-resistance rating of fire-resistance-rated construction, including, but not limited to, walls, firestops, shaft enclosures, partitions, smoke barriers, floors, fire-resistive coatings and sprayed fire-resistant materials applied to structural members and fire-resistant joint systems, shall be maintained. Such elements shall be visually inspected by the owner annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained. Where concealed, such elements shall not be required to be visually inspected by the owner unless the concealed space is able to be accessed by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space. Openings made therein for the passage of pipes, electrical conduit, wires, ducts, air transfer openings and holes made for any reason shall be protected with approved methods capable of resisting the passage of smoke and fire. Openings through fire-resistance-rated assemblies shall be protected by self- or automatic-closing doors of approved construction meeting the fire protection requirements for the assembly.

903.2.11.1 Opening dimensions and access. Openings shall have a minimum dimension of not less than 30 inches (762 mm). Such openings shall have access be provided for the fire department from the exterior and shall not be obstructed in a manner such that fire fighting or rescue cannot be accomplished from the exterior.

903.2.11.2 Rubbish and linen chutes. An automatic sprinkler system shall be installed at the top of rubbish and linen chutes and in their terminal rooms. Chutes shall have additional sprinkler heads installed at alternate floors and at the lowest intake. Where a rubbish chute extends through a building more than one floor below the lowest intake, the extension shall have sprinklers installed that are recessed from the drop area of the chute and protected from freezing in accordance with Section 903.3.1.1. Such sprinklers shall be installed at alternate floors beginning with the second level below the last intake and ending with the floor above the discharge. Chute Access to sprinklers in chutes shall have access be provided for servicing.

904.12.4 Special provisions for automatic sprinkler systems. Automatic sprinkler systems protecting commercial-type cooking equipment shall be supplied from a separate, readily accessible, indicating-type control valve that is identified. Access to the control valve shall be provided.

905.5 Location of Class II standpipe hose connections. Class II standpipe hose connections shall have access be available and shall be located so that all portions of the building are within 30 feet (9144 mm) of a nozzle attached to 100 feet (30 480 mm) of hose. Class II standpipe hose connections shall be located where they will have ready access.

905.6 Conspicuous location. Portable fire extinguishers shall be located in conspicuous locations where they will have ready access and be immediately available for use. These locations shall be along normal paths of travel, unless the fire code official determines that the hazard posed indicates the need for placement away from normal paths of travel.

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

Exceptions:

1. Manual fire alarm boxes in sleeping units of Group I-1 and I-2 occupancies shall be not required at exits if located at all care providers’ control stations or other constantly attended staff locations, provided such stations the manual fire alarm boxes are visible, provided with ready access and continuously available for access and that the distances of travel required in Section 907.4.2.1 are not exceeded.

2. Occupant notification systems are not required to be activated where private mode signaling installed in accordance with NFPA 72 is approved by the fire code official and staff evacuation responsibilities are included in the fire safety and evacuation plan required by Section 404.

907.2.10.1 Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in
A manual fire alarm system is not required in buildings not more than two stories in height where all individual sleeping units and contiguous attic and crawl spaces to those units are separated from each other and public or common areas by not less than 1-hour fire partitions and each individual sleeping unit has an exit directly to a public way, egress court or yard.

Manual fire alarm boxes are not required throughout the building where all of the following conditions are met:

1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. The notification appliances will actuate upon sprinkler water flow.
3. Not fewer than one manual fire alarm box is installed at an approved location.
4. Manual fire alarm boxes in resident or patient sleeping areas shall not be required at exits where located at all nurses' control stations or other constantly attended staff locations, provided such stations manual fire alarm boxes are visible, provided with ready access and continuously available for access and that the distances of travel required in Section 907.4.2.1 are not exceeded.

907.2.20 Covered and open mall buildings. Where the total floor area exceeds 50,000 square feet (4645 m²) within either a covered mall building or within the perimeter line of an open mall building, an emergency voice/alarm communication system shall be provided. Emergency access to emergency voice/alarm communication systems serving a mall, required or otherwise, shall have access be provided for the fire department. The system shall be provided in accordance with Section 907.5.2.2.

907.2.22.2 Other airport traffic control towers. Airport traffic control towers with a single exit or where sprinklers are not installed throughout shall be provided with smoke detectors in all of the following locations:

1. Airport traffic control cab.
2. Electrical and mechanical equipment rooms.
3. Airport terminal radar and electronics rooms.
4. Office spaces incidental to the tower operation.
5. Lounges for employees, including sanitary facilities.
7. Utility shafts with access where access to smoke detectors can be provided.

907.4.6 Unobstructed and unobscured. Manual fire alarm boxes shall be accessible provided with ready access, unobstructed, unobscured and visible at all times.

907.8.2 Testing. Testing shall be performed in accordance with the schedules in NFPA 72 or more frequently where required by the fire code official. Records of testing shall be maintained.

Exception: Devices or equipment that are not available for access inaccessible because of for safety considerations shall be tested during scheduled shutdowns where approved by the fire code official, but not less than every 18 months.

909.12.4 Automatic control. Where completely automatic control is required or used, the automatic-control sequences shall be initiated from an appropriately zoned automatic sprinkler system complying with Section 903.3.1.1, manual controls that have ready access provided with ready access for the fire department and any smoke detectors required by the engineering analysis.

910.4.5 Manual control location. Manual controls shall be located so as where they are able to have access be accessed by the fire service from an exterior door of the building and protected against interior fire exposure, separated from the remainder of the building by not less than 1-hour fire barriers constructed in accordance with Section 707 of the International Building Code or horizontal assemblies constructed in accordance with Section 711 of the International Building Code, or both.

914.2.3 Emergency voice/alarm communication system. Where the total floor area exceeds 50,000 square feet (4645 m²) within either a covered mall building or within the perimeter line of an open mall building, an emergency voice/alarm communication system shall be provided. Emergency voice/alarm communication systems serving a mall, required or otherwise, shall have access be provided for the fire department. The system shall be provided in accordance with Section 907.5.2.2.

1105.9 Group I-2 automatic fire alarm system. An automatic fire alarm system shall be installed in existing Group I-2 occupancies in accordance with Section 907.2.6.2.

Exception: Manual fire alarm boxes in patient sleeping areas shall not be required at exits if located at all nurses' control stations or other constantly attended staff locations, provided such stations manual fire alarm boxes are visible and continuously open for, provided with ready access and that travel distances required in Section 907.4.2.1 are not exceeded.

2005.4 On aircraft fuel-servicing tank vehicles. Aircraft fuel-servicing tank vehicles shall be equipped with not less than two
listed portable fire extinguishers complying with Section 906, each having a minimum rating of 20-B:C. A portable fire extinguisher shall be provided with ready access from either side of the vehicle.

2005.7 Fire extinguisher access. Portable fire extinguishers required by this chapter shall have access be maintained at all times. Where necessary, provisions shall be made to clear accumulations of snow, ice and other forms of weather-induced obstructions.

2005.7.1 Cabinets. Cabinets and enclosed compartments used to house portable fire extinguishers shall be clearly marked with the words FIRE EXTINGUISHER in letters not less than 2 inches (51 mm) high. Cabinets and compartments shall be provided with ready access at all times.

2006.6.1 Accessibility Emergency fuel shutoff controls. Emergency fuel shutoff controls shall be provided with ready access at all times when the fueling system is being operated.

2303.2 Emergency disconnect switches. An approved, clearly identified emergency disconnect switch with ready access shall be provided at an approved location to stop the transfer of fuel to the fuel dispensers in the event of a fuel spill or other emergency. The emergency disconnect switch for exterior fuel dispensers shall be provided with ready access and shall be located within 100 feet (30 480 mm) of, but not less than 20 feet (6096 mm) from, the fuel dispensers. For interior fuel-dispensing operations, the emergency disconnect switch shall shall be provided with ready access and be installed at an approved location. Such devices shall be distinctly labeled as: EMERGENCY FUEL SHUTOFF. Signs shall be provided in approved locations.

2308.6 Valves. Gas piping to equipment shall be provided with a remote, manual shutoff valve that is readily accessible provided with ready access.

2310.6.3 Access. Where the pier is designed for vehicular traffic, an unobstructed roadway to the shore end of the wharf shall be maintained for access by fire apparatus.

2404.3.2.5 Clear space. Spray booths shall be installed so that all parts of the booth are able to be accessed for cleaning. A clear space of not less than 3 feet (914 mm) shall be maintained on all sides of the spray booth. This clear space shall be kept free of any storage or combustible construction.

Exceptions:

1. This requirement shall not prohibit locating a spray booth closer than 3 feet (914 mm) to or directly against an interior partition, wall or floor/ceiling assembly that has a fire-resistance rating of not less than 1 hour, provided the spray booth can be adequately maintained and cleaned.

2. This requirement shall not prohibit locating a spray booth closer than 3 feet (914 mm) to an exterior wall or a roof assembly, provided the wall or roof is constructed of noncombustible material and the spray booth can be adequately maintained and cleaned.

2404.7.8.2 Attachment. Overspray collection filters shall be readily removable and have access able to be accessed for cleaning or replacement.

2404.8.1.2 Alarm station location. Not less than one manual fire alarm and emergency system shutdown station shall have ready access and be provided with ready access for operating personnel. Where access to this station is likely to involve exposure to danger, an additional station shall be located adjacent to an exit from the area.

2405.3.2 Bottom drains. Dip tanks greater than 500 gallons (1893 L) in liquid capacity shall be equipped with bottom drains that are arranged to automatically and manually drain the tank quickly in the event of a fire unless the viscosity of the liquid at normal atmospheric temperature makes this impractical. Manual access to the manual operation shall be from a safe, location with access. Where gravity flow is not practicable, automatic pumps shall be provided. Such drains shall be trapped and discharged to a closed, vented salvage tank or to an approved outside location.

Exception: Dip tanks containing Class IIIB combustible liquids where the liquids are not heated above room temperature and the process area is protected by automatic sprinklers.

2703.10.1.1 Combustible workstations. A sprinkler head shall be installed within each branch exhaust connection or individual plenums of workstations of combustible construction. The sprinkler head in the exhaust connection or plenum shall be located not more than 2 feet (610 mm) from the point of the duct connection or the connection to the plenum. Where necessary to prevent corrosion, the sprinkler head and connecting piping in the duct shall be coated with approved or listed corrosion-resistant materials. The Access to the sprinkler head shall have access be provided for periodic inspection.

Exceptions:

1. Approved alternative automatic fire-extinguishing systems are allowed. Activation of such systems shall deactivate the related processing equipment.

2. Process equipment that operates at temperatures exceeding 932°F (500°C) and is provided with automatic shutdown capabilities for hazardous materials.

3. Exhaust ducts 10 inches (254 mm) or less in diameter from flammable gas storage cabinets that are part of a
4. Ducts listed or approved for use without internal automatic sprinkler protection.

2703.10.4.4.5 Maintenance and inspection. Sprinklers Access to sprinklers in exhaust ducts shall have access be provided for periodic inspection and maintenance.

2903.3 Fire-fighting access. Organic The fire department shall be able to access the organic coating manufacturing operations shall have access from not less than one side for the purpose of fire control. Approved aisles shall be maintained for the unobstructed movement of personnel and fire suppression equipment.

3201.4 Evacuation Fire safety and evacuation plan. Where required by the fire code official, Section 403, a fire safety and evacuation plan for areas open to the public and a separate set of plans indicating location and width of aisles, location of exits, exit access doors, exit signs, height of storage, and locations of hazardous materials shall be submitted at the time of permit application for review and approval. Following approval of the plans, a copy of the approved plans plan shall be maintained on the premises in an approved location.

3206.6.1 Access to doors. Where building access is required by Table 3206.2, fire department access doors shall be provided in accordance with this section. Access doors shall be able to be reachable, accessed without the use of a ladder.

3309.1 Emergency telephone. Emergency telephone facilities with ready access ready access shall be provided in an approved location at the construction site or an approved equivalent means of communication shall be provided. The street address of the construction site and the emergency telephone number of the fire department shall be posted adjacent to the telephone or where an equivalent means of communication has been approved the site address and fire department emergency telephone number shall be posted at the main entrance to the site, in guard shacks and in the construction site office.

3504.2.6 Fire extinguisher. Not less than one portable fire extinguisher complying with Section 906 and with a minimum 2-A:20-B:C rating shall be provided with ready access ready access within 30 feet (9144 mm) of the location where hot work is performed.

5003.2.2.1 Design and construction. Piping, tubing, valves, fittings and related components used for hazardous materials shall be in accordance with the following:

1. Piping, tubing, valves, fittings and related components shall be designed and fabricated from materials that are compatible with the material to be contained and shall be of adequate strength and durability to withstand the pressure, structural and seismic stress and exposure to which they are subject.
2. Piping and tubing shall be identified in accordance with ASME A13.1 to indicate the material conveyed.
3. Manual valves or automatic remotely activated fail-safe emergency shutoff valves shall be installed on supply piping and tubing and provided with ready access at the following locations:
   3.1. The point of use.
   3.2. The tank, cylinder or bulk source.
4. Manual emergency shutoff valves and controls for remotely activated emergency shutoff valves shall be provided with ready access and the location shall be accessible, and indicated by means of a sign.
5. Backflow prevention or check valves shall be provided where the backflow of hazardous materials could create a hazardous condition or cause the unauthorized discharge of hazardous materials.
6. Where gases or liquids having a hazard ranking of:

   Health Class 3 or 4
   Flammability Class 4
   Instability Class 3 or 4

   in accordance with NFPA 704 are carried in pressurized piping above 15 pounds per square inch gauge (psig) (103 kPa), an approved means of leak detection and emergency shutoff or excess flow control shall be provided. Where the piping originates from within a hazardous material storage room or area, the excess flow control shall be located within the storage room or area.

   Where the piping originates from a bulk source, the excess flow control shall be located as close to the bulk source as practical.

   Exceptions:
   1. Piping for inlet connections designed to prevent backflow.
   2. Piping for pressure relief devices.

5305.4 Valves. Valves utilized on compressed gas systems shall be suitable for the use intended and, Access to such valves shall be in a location with access provided and maintained. Valve handles or operators for required shutoff valves shall not be removed or otherwise altered to prevent access.

5503.4.3 Identification of containers. Stationary containers shall be identified with the manufacturing specification and maximum allowable working pressure with a permanent nameplate. The nameplate shall be installed on the container in a location provided with ready access. The nameplate shall be marked in accordance with the ASME Boiler and Pressure
Suitably protected against fire exposure.
Located where leakage can be readily controlled by operation of remotely located valves in a location provided with ready access.
Located where leakage from failure would not unduly expose people or structures.
Piping on wharves shall be bonded and grounded where Class I and II liquids are transported. Where excessive stray currents are encountered, insulating joints shall be installed. Bonding and grounding connections on piping shall be located on the wharf side of hose riser insulating flanges, where used, and shall be in a location provided with ready access for inspection.
1. Hose or articulated swivel-joint pipe connections used for cargo transfer shall be capable of accommodating the combined effects of change in draft and maximum tidal range, and mooring lines shall be kept adjusted to prevent surge of the vessel from placing stress on the cargo transfer system.
9. Hoses shall be supported to avoid kinking and damage from chafing.

5703.6.2.1 Special materials. Low-melting-point materials (such as aluminum, copper or brass), materials that soften on fire exposure (such as nonmetallic materials) and nonductile material (such as cast iron) shall be acceptable for use underground in accordance with the applicable standard listed in Table 5703.6.2. Where such materials are used outdoors in above-ground piping systems or within buildings, they shall be in accordance with the applicable standard listed in Table 5703.6.2 and one of the following:
1. Suitably protected against fire exposure.
2. Located where leakage from failure would not unduly expose people or structures.
3. Located where leakage can be readily controlled by operation of remotely located valves in a location provided with ready access.

In all cases, nonmetallic piping shall be used in accordance with Section 27.4.6 of NFPA 30.

5703.6.6.1 Backflow protections. Connections to pipelines or piping by which equipment (such as tank cars, tank vehicles or marine vessels) discharges liquids into storage tanks shall be provided with check valves or block valves for automatic protection against backflow where the piping arrangement is such that backflow from the system is possible. Where loading and unloading is done through a common pipe system, a check valve is not required. However, a block valve, located in an area where it is provided with ready access or remotely operable, shall be provided.

5704.2.9.7.5.1 Information signs. A permanent sign shall be provided at the fill point for the tank, documenting the filling procedure and the tank calibration chart.
Exception: Where climatic conditions are such that the sign may be obscured by ice or snow, or weathered beyond readability or otherwise impaired, said procedures and chart shall be located in the office window, lock box or other area available to the person filling the tank.

5706.4.7.6 Piping, valves and fittings. Piping valves and fittings shall be in accordance with Section 5703.6 except as modified by the following:
1. Flexibility of piping shall be ensured by appropriate layout and arrangement of piping supports so that motion of the wharf structure resulting from wave action, currents, tides or the mooring of vessels will not subject the pipe to repeated excessive strain.
2. Pipe joints that depend on the friction characteristics of combustible materials or on the grooving of pipe ends for mechanical continuity of piping shall not be used.
3. Swivel joints are allowed in piping to which hoses are connected and for articulated, swivel-joint transfer systems, provided the design is such that the mechanical strength of the joint will not be impaired if the packing materials fail such as by exposure to fire.
4. Each line conveying Class I or II liquids leading to a wharf shall be provided with a block valve located where its is provided with ready access and on shore near the approach to the wharf and outside of any diked area. Where more than one line is involved, the valves shall be grouped in one location.
5. Means shall be provided for easy access to cargo line valves located below the wharf deck.
6. Piping systems shall contain a sufficient number of valves to operate the system properly and to control the flow of liquid in normal operation and in the event of physical damage.
7. Piping on wharves shall be bonded and grounded where Class I and II liquids are transported. Where excessive stray currents are encountered, insulating joints shall be installed. Bonding and grounding connections on piping shall be located on the wharf side of hose riser insulating flanges, where used, and shall be in a location provided with ready access for inspection.
8. Hose or articulated swivel-joint pipe connections used for cargo transfer shall be capable of accommodating the combined effects of change in draft and maximum tidal range, and mooring lines shall be kept adjusted to prevent surge of the vessel from placing stress on the cargo transfer system.

5706.4.10.4 Fire apparatus access. Where the wharf is designed for vehicular traffic, an unobstructed fire apparatus access road to the shore end of the wharf shall be maintained in accordance with Chapter 5.

5706.5.3.1.1 Shutoff valves. Approved automatically or manually activated shutoff valves shall be provided where the transfer hose connects to the process piping, and on both sides of any exterior fire-resistance-rated wall through which the piping passes. Manual shutoff valves shall be arranged so that they are able to be accessed from grade. Valves shall not be locked in the open position.

6004.2.2.10.3 Shut off of gas supply. The gas-detection system shall automatically close the shutoff valve at the source on gas supply piping and tubing related to the system being monitored for whichever gas is detected.
Exception: Automatic shutdown is not required for reactors utilized for the production of highly toxic or toxic compressed gases where such reactors are:
1. Operated at pressures less than 15 pounds per square inch gauge (psig) (103.4 kPa).
2. Constantly attended.
3. Provided with emergency shutoff valves provided with ready access.

**D102.1 Access and loading.** Facilities, buildings or portions of buildings hereafter constructed shall be provided with an approved fire apparatus access road with an asphalt, concrete or other approved driving surface capable of supporting the imposed load of fire apparatus weighing at least 75,000 pounds (34 050 kg).

**I101.3 Noncompliant conditions requiring component repair or replacement.** The following shall be deemed noncompliant conditions and shall cause the related component(s) to be repaired or replaced to comply with the provisions of this code:

1. Sprinkler and standpipe system piping and fittings having any of the following conditions:
   1.1. Signs of leakage.
   1.2. Evidence of corrosion.
   1.3. Misalignment.
   1.4. Mechanical damage.
2. Sprinkler piping support having any of the following conditions:
   2.1. Materials resting on or hung from sprinkler piping.
   2.2. Damaged or loose hangers or braces.
3. Class II and Class III standpipe systems having any of the following conditions:
   3.1. No hose or nozzle, where required.
   3.2. Hose threads incompatible with fire department hose threads.
   3.3. Hose connection cap missing.
   3.4. Mildew, cuts, abrasions and deterioration evident.
   3.5. Coupling damaged.
   3.6. Gaskets missing or deteriorated.
   3.7. Nozzle missing or obstructed.
4. Hose racks and cabinets having any of the following conditions:
   4.1. Difficult to operate or damaged.
   4.2. Hose improperly racked or rolled.
   4.3. Inability of rack to swing 90 degrees (1.57 rad) out of the cabinet.
   4.4. Cabinet locked, except as permitted by this code.
   4.5. Cabinet door will not fully open.
   4.6. Door glazing cracked or broken.
5. Portable fire extinguishers having any of the following conditions:
   5.1. Broken seal or tamper indicator.
   5.2. Expired maintenance tag.
   5.3. Pressure gauge indicator in "red."
   5.4. Signs of leakage or corrosion.
   5.5. Mechanical damage, denting or abrasion of tank.
   5.6. Presence of repairs such as welding, soldering or brazing.
   5.7. Damaged threads.
   5.8. Damaged hose assembly, couplings or swivel joints.
6. Fire alarm and detection control equipment, initiating devices and notification appliances having any of the following conditions:
   6.1. Corroded or leaking batteries or terminals.
   6.2. Smoke detectors having paint or other ornamentation that is not factory-applied.
   6.3. Mechanical damage to heat or smoke detectors.
   6.4. Tripped fuses.
7. Fire department connections having any of the following conditions:
   7.1. Fire department connections are not visible or available for access from the fire apparatus access road.
   7.2. Couplings or swivels are damaged
   7.3. Plugs and caps are missing or damaged.
   7.4. Gaskets are deteriorated.
   7.5. Check valve is leaking.
   7.6. Identification signs are missing.
8. Fire pumps having any of the following conditions:
   8.1. Pump room temperature is less than 40°F (4.4°C).
8.2. Ventilating louvers are not freely operable.
8.3. Corroded or leaking system piping.
8.4. Diesel fuel tank is less than two-thirds full.
8.5. Battery readings, lubrication oil or cooling water levels are abnormal.

L104.6 Isolation valves. System isolation valves that are available for access by the fire department shall be installed on the system riser to allow piping beyond any air cylinder refill panel to be blocked. Access to the system isolation valves shall be provided for the fire department.

L104.14.1 Location. The location of the external mobile air connection shall be approved by the code official and available for access by mobile air apparatus and approved by the fire chief. Access to the external mobile air connection shall be provided for use by mobile air apparatus.

2015 International Wildland-Urban Interface Code

[A] 109.1.1 General. Construction or work for which a permit is required by this code shall be subject to inspection by the code official and such construction or work shall remain open for access visible and exposed, able to be accessed for inspection purposes until approved by the code official.

It shall be the duty of the permit applicant to cause the work to remain open for access visible and exposed, able to be accessed for inspection purposes. Neither the code official nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid.

Where required by the code official, a survey of the lot shall be provided to verify that the mitigation features are provided and the building or structure is located in accordance with the approved plans.

403.1 Restricted access. Where emergency vehicle access is restricted because of secured access roads or driveways or where immediate access is necessary for life-saving or fire-fighting purposes, the code official is authorized to require a key box to be installed in an approved location with access. The key box shall be of a type approved by the code official and shall contain keys to gain necessary access as required by the code official.

ALTERNATIVE CONCEPTS

This appendix chapter provides consideration of the following alternatives: (1) exterior sprinkler systems, (2) alternative water supply systems for exposure protection, (3) Class A foam systems, (4) enhanced exterior fire protection, (5) sheltering in place, and (6) building location.

**Exterior sprinkler systems.** Currently, there is no nationally accepted standard for the design and installation of exterior fire sprinkler systems. Interior sprinkler systems are regulated by nationally recognized standards that have specific requirements. However, exterior sprinkler systems lack such uniformity. What is generally proposed is a type of sprinkler system, placed on the roofs or eaves of a building, whose primary purpose is to wet down the roof. These types of systems can be activated either manually or automatically. However, the contemporary thought on exterior sprinkler systems is that if the roof classification is of sufficient fire resistance, exterior sprinklers are of little or no value.

Another option and alternative with exterior sprinklers is to use them to improve the relative humidity and fuel moisture in the defensible space. In this case, the exterior sprinkler is not used to protect the structure as much as it attempts to alter the fuel situation. However, studies do not support the idea that merely spraying water into the air in the immediate vicinity of a rapidly advancing wildland-urban fire does much good. Clearly, irrigation systems that keep plants healthy and fire-resistive plants that resist convection and radiated heat can accomplish the same purpose.

**Alternative water supply systems for exposure protection.** Pools and spas are often offered as an alternative water source for fire departments. These water sources must be open for provided with access and reliable to be of any use by fire protection forces. Accessibility means that the fire department must be able to withdraw the water without having to go through extraordinary measures such as knocking down fences or having to set up drafting situations. Designs have been created to put liquid- or gas-fueled pumps or gravity valves on pools and spas to allow fire departments to access these water systems. A key vulnerability to the use of these alternative water systems is loss of electrical power. When the reliability of a water system depends on external power sources, it cannot be relied upon by fire fighters to be available in a worstcase scenario.

**Class A foam systems.** A new and emerging technology is the concept of Class A foam devices. These are devices that allow a homeowner to literally coat the exterior of their house with a thick layer of foam that prevents the penetration of embers and radiant heat to the structure. There is no nationally recognized standard for Class A foam technology; however, experiments in various wildland fire agencies seem to advocate foaming houses in advance of fire and flame fronts. To be accepted by the code official, the Class A foam system should pass rigorous scrutiny with regard to the manner and needs in which it is activated, the ways and means in which it is properly maintained, and a ways and means to test the system for its operational readiness during hiatus between emergencies.

**Enhanced exterior fire protection.** This alternative method would increase the degree of fire resistance on the exterior of a
building. This is most often an alternative recommended as a retroactive application when individual properties cannot achieve adequate defensible space on the exterior of a building. Normally, fire resistance and building scenarios are concerned with containing a fire. Fire-resistance ratings within building design infers resistance to a fire for the specified time to compartmentalize the building's interior.

To improve fire resistance on the exterior of the structure, the primary emphasis is on preventing intrusion into the building. This means protection of apertures and openings that may or may not be required to have any degree of fire resistance by accepted building codes. The option that is available here is for individuals to provide coverage in the form of shutters or closures to these areas, which, along with maintenance of perimeter-free combustibles, can often prevent intrusion.

There are obvious limitations to this alternative. First and foremost is the means of adequately evaluating the proposed fire resistance of any given assembly. Testing techniques to determine fire resistance for such objects as drywall and other forms of construction may not be applicable to exterior application. Nonetheless, code officials should determine the utility of a specific fire resistance proposal by extrapolating conservatively.

Shelter in place. Developments in the wildland-urban interface may be designed to allow occupants to “Shelter in Place.” Use of this design alternative should include fire-resistant construction, access, water supply, automatic sprinkler systems, provisions for and maintenance of defensible space, and a Fire Protection Plan.

A Fire Protection Plan describes ways to minimize fire problems created by a specific project or development. The purpose for the Fire Protection Plan is to reduce the burden and impact of the project or development on the community's fire protection delivery system. The plan may utilize components of land use, building construction, vegetation management and other design techniques and technologies. It should include specific mitigation measures consistent with the unique problems resulting from the location, topography, geology, flammable vegetation and climate of the proposed site. The plan shall be consistent with this code, and approved by the code official. The cost of preparation and review is to be borne by the project or development proponent.

Building location. The location of a new building within lot lines should be considered as it relates to topography and fire behavior. Buildings located in natural chimneys, such as narrow canyons and saddles, are especially fire prone because winds are funneled into these areas and eddies are created. Buildings located on narrow ridges without setbacks may be subjected to increased flame and convective heat exposure from a fire advancing from below. Stone or masonry walls can act as heat shields and deflect the flames. Swimming pools and rated or noncombustible decks and patios can be used to create a setback, decreasing the exposure to the structure. Attic and under floor vents, picture windows and sliding glass doors should not face possible corridors due to the increased risk of flame or ember penetration.

2015 International Mechanical Code

[F] 513.12.4 Automatic control. Where complete automatic control is required or used, the automatic control sequences shall be initiated from an appropriately zoned automatic sprinkler system complying with Section 903.3.1.1 of the International Fire Code, from manual controls provided with ready access by the fire department, and any smoke detectors required by engineering analysis.

Commenter's Reason: This Public Comment responds to two issues raised and the CAH in Louisville.

First, when comparing the approach between F1 and F12, the approach taken by F12 was preferred at the CAH. So this Public Comment takes the approach of using the terms “access to” and ready access” when referring to the ability to use or access controls or components. The term ‘accessible’ is defined in the IBC and relates to elements and facilities that serve or have special accommodations for persons with mobility impairments. The terms “access to” and “ready access” are used in the IPC and IMC. Those definitions are proposed to be included here.

[M]ACCESS (TO). That which enables a device, appliance or equipment to be reached by ready access or by a means that first requires the removal or movement of a panel, door or similar obstruction [see also “Ready access (to)”.

[M]READY ACCESS (TO). That which enables a device, appliance or equipment to be directly reached, without requiring the removal or movement of any panel, door or similar obstruction [see “Access (to)”].

Second, issues were raised regarding the actual wording proposed for the various sections throughout the codes. This Public Comment has reviewed each occurrence and made revisions as needed. The items shown in the Public Comment are revisions to the original proposal. Revisions from the original proposal which were found to be satisfactory are listed at the end of this reason statement.

Additionally, other code change proposals were heard at the Committee Action Hearing in Louisville that affected some of the sections contained in this Public Comment. The following sections contain modifications based on the CAH actions so that it is clear how the revised wording herein will fit with the other proposals.

<table>
<thead>
<tr>
<th>Section #</th>
<th>Code Change Item #</th>
<th>CAH Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFC 106.3</td>
<td>ADM82-16</td>
<td>Approved as Modified</td>
</tr>
<tr>
<td>IFC 3201.4</td>
<td>F313-16</td>
<td>Approved as Submitted</td>
</tr>
<tr>
<td>IFC 3206.6.1</td>
<td>F316-16</td>
<td>Approved as Submitted</td>
</tr>
<tr>
<td>IFC 3309.1</td>
<td>F327-16</td>
<td>Approved as Modified</td>
</tr>
<tr>
<td>IWUIC 109.1.1 ADM82-16</td>
<td></td>
<td>Approved as Modified</td>
</tr>
</tbody>
</table>
In addition to the definitions above, the following sections were revised in the original proposal and no modifications to these sections are included in this Public Comment. These sections will go forward with the modifications shown in the original proposal.

IFC 311.21
IFC 403.10.2.2.1
IFC 907.2
IFC 907.2.6.3.3
IFC 2301.1
IFC 2306.2.5
IFC 3206.9.1.1
IFC 3313.1
IFC 3503.6
IFC 5004.2.3
IFC 5303.5.3
IFC 5606.5.2.1
IFC 5606.5.2.3
IFC 5704.2.9.6.2
IFC 5704.3.5.4
IFC 5704.3.6.2
IFC 5706.5.4.5
IFC 6109.9
IFC 6109.10
IFC 6109.15

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)
Proposed Change as Submitted

Proponent: Greg Rogers, representing Washington State Association Fire Marshals

2015 International Fire Code

CHAPTER 1 SCOPE AND ADMINISTRATION

SECTION 105 PERMITS

105.6.30 Miscellaneous combustible storage. An operational permit is required to store in any building or upon any premises in excess of 2,500 cubic feet (71 m$^3$) gross volume of combustible empty packing cases, boxes, barrels or similar containers, combustible pallets, rubber tires, rubber, cork or similar combustible material.

CHAPTER 3 GENERAL REQUIREMENTS

SECTION 315 GENERAL STORAGE

Revise as follows:

315.1 General. Storage shall be in accordance with Sections 315.2 through 315.5. Outdoor pallet storage shall be in accordance with Section 315.2 and 315.7.

Add new text as follows:

315.7 Outdoor Pallet Storage. Pallets shall be stored outdoors and shall comply with Sections 315.7 through 315.7.8. Pallets stored within a building shall be protected in accordance with Chapter 32.

315.7.1 Storage beneath overhead projections from buildings. Where buildings are equipped throughout with an automatic sprinkler system, the outdoor storage of pallets under eaves, canopies or other projections or overhangs are prohibited except where automatic sprinklers are installed under such eaves, canopies or other projections or overhangs.

315.7.2 Distance to lot line. Pallet storage shall not be located within 10 feet (3048 mm) of a lot line.

315.7.3 Storage height. Pallet storage shall not exceed 20 feet (6096 mm) in height.

315.7.4 Pallet pile stability and size. Pallet stacks shall be arranged to form stable piles. Individual pallet piles shall not cover an area of greater than 400 ft$^2$ (37 m$^2$).

315.7.5 Pallet types. Wood pallets shall be all wood with slatted or solid top or bottom, with metal fasteners or shall be plastic or composite pallets listed and labeled in accordance with UL 2335 or FM 4996. Plastic pallets shall be both solid and gridded deck, independent of the pallet manufacturing process, type of resin used in fabrication, or geometry of the pallet.

315.7.6 Pile separation distances. In addition to the other requirements of this section, wood pallet stacks and piles shall be in accordance with the separation distances in Table 315.7.6(a) and plastic pallet stacks and piles shall be in accordance with separation distances in Table 315.7.6(b).

**TABLE 315.7.6(a)**

<table>
<thead>
<tr>
<th>Wall Construction</th>
<th>Wood Pallet Separation Distance, ft (m)</th>
<th>Plastic Pallets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall Construction</td>
<td>Wood Pallet Separation Distance, ft (m)</td>
<td>Wood Pallet Separation Distance, ft (m)</td>
</tr>
<tr>
<td>Type of Wall</td>
<td>Window Openings</td>
<td>&lt; or =50 Pallets</td>
</tr>
<tr>
<td>Masonry</td>
<td>None</td>
<td>2 (0.6)</td>
</tr>
<tr>
<td>Masonry</td>
<td>Wired Glass with Open Sprinklers</td>
<td>2 (0.6)</td>
</tr>
<tr>
<td>Masonry</td>
<td>Wired Glass</td>
<td>10 (3.0)</td>
</tr>
<tr>
<td>Masonry</td>
<td>Plain Glass with Open Sprinklers</td>
<td>10 (3.0)</td>
</tr>
<tr>
<td>Noncombustible</td>
<td>None</td>
<td>10 (3.0)</td>
</tr>
<tr>
<td>Wood with Open Sprinklers</td>
<td>10 (3.0)</td>
<td>5 (1.5)</td>
</tr>
<tr>
<td>Wood</td>
<td>None</td>
<td>15 (4.5)</td>
</tr>
</tbody>
</table>
### TABLE 315.7.6(b)

<table>
<thead>
<tr>
<th>Plastic Pallet Separation</th>
<th>Wall Construction</th>
<th>Type of Wall</th>
<th>Plastic Pallet Separation Distance, ft (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wall Construction</td>
<td></td>
<td>Plastic Pallet Separation Distance, ft (m)</td>
</tr>
<tr>
<td></td>
<td>Type of Wall</td>
<td>Pallets</td>
<td>Plastic Pallet Separation Distance, ft (m)</td>
</tr>
<tr>
<td></td>
<td>Window Openings</td>
<td>Pallets</td>
<td>Plastic Pallet Separation Distance, ft (m)</td>
</tr>
<tr>
<td>Masonry</td>
<td>None</td>
<td>2 (0.6)</td>
<td>2 (0.6)</td>
</tr>
<tr>
<td>Masonry</td>
<td>Wired Glass with Open Sprinklers</td>
<td>10 (3.0)</td>
<td>20 (6.0)</td>
</tr>
<tr>
<td>Masonry</td>
<td>Wired Glass</td>
<td>15 (4.5)</td>
<td>40 (12.0)</td>
</tr>
<tr>
<td>Masonry</td>
<td>Plain Glass with Open Sprinklers</td>
<td>15 (4.5)</td>
<td>40 (12.0)</td>
</tr>
<tr>
<td>Noncombustible</td>
<td>None</td>
<td>15 (4.5)</td>
<td>40 (12.0)</td>
</tr>
<tr>
<td>Wood with Open Sprinklers</td>
<td>None</td>
<td>15 (4.5)</td>
<td>40 (12.0)</td>
</tr>
<tr>
<td>Wood</td>
<td>None</td>
<td>30 (9.0)</td>
<td>80 (24.0)</td>
</tr>
<tr>
<td>Any</td>
<td>Plain Glass</td>
<td>30 (9.0)</td>
<td>80 (24.0)</td>
</tr>
<tr>
<td>Between Pallet Piles</td>
<td>15 (4.5)</td>
<td>30 (9.0)</td>
<td>80 (24.0)</td>
</tr>
<tr>
<td>Other on-site storage</td>
<td>15 (4.5)</td>
<td>75 (22.5)</td>
<td></td>
</tr>
</tbody>
</table>

### 315.7.7 Prohibited locations

Pallets shall not be stored underneath high-voltage transmission lines, elevated roadways or elevated railways.

**Reason:** There has been an increasing number of large scale fires involving the outdoor storage of combustible pallets. Numerous local jurisdictions have been adding local requirements to their fire code adoptions to deal with this increased fire threat. These new requirements are to provide code language in the IFC addressing the high challenge fire protection issues involving large amounts of idle pallets.

In prior additions of the IFC there was a reference to NFPA 230 Fire Protection of Storage. Within that document were requirements for outdoor storage of pallets, however, NFPA discontinued maintenance of that document and the storage requirements for pallets and other materials were placed within NFPA 1 Fire Code.

NFPA 1 Fire Code regulates the Storage of Idle Pallets at Section 34.10.1

NFPA 1 Fire Code partial extract with annex notes.


34.10 Storage of Idle Pallets.

34.10.1 General. Idle pallets shall be stored outside or in a separate building designated for pallet storage, unless permitted by 34.10.2.

A 34.10.1 Idle pallet storage introduces a severe fire condition. Stacking idle pallets in piles is the best arrangement of combustibles to promote rapid spread of fire, heat release, and complete combustion. After pallets are used for a short time in warehouses, they dry out and edges become frayed and splintered. In this condition they are subject to easy ignition from a small ignition source. Again, high piling increases considerably both the challenge to sprinklers and the probability of involving a large number of pallets when fire occurs. Therefore storing idle pallets outdoors where possible is preferable. A fire in idle plastic or wooden pallets is one of the greatest challenges to sprinklers. The undersides of the pallets create a dry area on which a fire can grow and expand to other dry or partially wet areas. This process of jumping to other dry, closely located, parallel, combustible surfaces continues until the fire bursts through the top of the stack. Once this happens, very little water is
able to reach the base of the fire. The only practical method of stopping a fire in a large concentration of pallets with ceiling sprinklers is by means of prewetting. In high stacks, prewetting cannot be done without abnormally high water supplies. The storage of idle pallets should not be permitted in an unsprinklered warehouse containing other storage.

34.10.2 Indoor Storage. Idle pallets shall be permitted to be stored in a building used for other storage or other purpose if the building is sprinklered in accordance with Section 13.3.

34.10.3* Outdoor Storage. Idle pallets stored outside shall be stored in accordance with Table 34.10.3(a) and Table 34.10.3(b). A.34.10.3 The practice that some materials are stored on pallets in an open yard is recognized. Since stacks of idle pallets present a severe fire problem, attention needs to be paid to the storage arrangements of the pallets. Manual outside open sprinklers generally are not a reliable means of protection unless property is attended to at all times by plant emergency personnel. Open sprinklers with a deluge valve are preferred.

In addition to the old NFPA 230 and current NFPA 1 language, FM Global produces a Property Loss Prevention Data Sheet 8-24 Idle Pallet Storage which has similar requirements for outdoor pallet storage. One significant difference is that the FM Global document provides increased separation distances for the storage of plastic pallets. This proposal utilized the general storage provisions currently in Section 315 of the IFC along with the provisions of the NFPA 1 and FM Global requirements to develop these outdoor storage requirements. The distances in the tables are primarily from the FM Global document with other distances extracted from NFPA 1 or the current IFC provisions. Since the requirements are currently in existence and have been for some time, they serve as an existing standard to be applied.

Cost Impact: Will not increase the cost of construction

This proposal addresses exterior storage of pallets and does not impact the cost of construction.

Public Hearing Results

Committee Action: Approved as Modified

Modification:

315.1 General. Storage shall be in accordance with Sections 315.2 through 315.6. Outdoor pallet storage shall be in accordance with Section 315.2 and 315.7.

315.7 Outdoor Pallet Storage Pallets shall be stored outdoors and shall comply with Sections 315.7 through 315.7.8. Pallets stored within a building shall be protected in accordance with Chapter 32.

315.7.5 Pallet types Wood pallets Pallets shall be all wood, with slatted or solid top or bottom, with metal fasteners, or shall be plastic or composite pallets listed and labeled in accordance with UL 2335 or FM 4996. Plastic pallets shall be both solid and gridded deck, independent of the pallet manufacturing process, type of resin used in fabrication, or geometry of the pallet.

Committee Reason: The committee approved the proposal as the requirements for pallet storage were needed and this proposal with modifications addressed these concerns. There were a couple minor modifications. The first modification simply correlates with the action taken on code change proposal F295-16 that addresses pallet manufacturing and recycling facilities. The exception clarifies that this proposal only deals with storage of these pallets. The additional revisions were editorial. The original language mandated that pallet storage be outside. Instead, the intent was simply to regulate in accordance with these sections when such pallets were stored outside.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Safi First (rjd@davidsoncodeconcepts.com) requests Approve as Modified by this Public Comment.
### TABLE 315.7.6(a)
Separation Distance between Wood Pallet Stacks and Buildings

<table>
<thead>
<tr>
<th>Wall Construction</th>
<th>Type of Wall</th>
<th>Masonry</th>
<th>Plastic Pallet Separation Distance, ft (m)</th>
<th>Plastic Pallet Separation Distance, ft (m)</th>
<th>Plastic Pallet Separation Distance, ft (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall Construction</td>
<td>Window Openings</td>
<td>None</td>
<td>≤ 50 Pallets</td>
<td>51 to 200 Pallets</td>
<td>&gt;200 Pallets</td>
</tr>
<tr>
<td>Masonry</td>
<td>Wired glass Fire-rated glazing with Open Sprinklers</td>
<td>2 (0.6)</td>
<td>5 (1.5)</td>
<td>20 (6.0)</td>
<td></td>
</tr>
<tr>
<td>Masonry</td>
<td>Wired glass Fire-rated Glazing</td>
<td>10 (3.0)</td>
<td>5 (1.5)</td>
<td>20 (6.0)</td>
<td></td>
</tr>
<tr>
<td>Masonry</td>
<td>Plain Glass with Open Sprinklers</td>
<td>10 (3.0)</td>
<td>5 (1.5)</td>
<td>20 (6.0)</td>
<td></td>
</tr>
<tr>
<td>Noncombustible</td>
<td>None</td>
<td>10 (3.0)</td>
<td>5 (1.5)</td>
<td>20 (6.0)</td>
<td></td>
</tr>
<tr>
<td>Wood with Open Sprinklers</td>
<td>Wired glass Fire-rated glazing with Open Sprinklers</td>
<td>10 (3.0)</td>
<td>5 (1.5)</td>
<td>20 (6.0)</td>
<td></td>
</tr>
<tr>
<td>Wood</td>
<td>None</td>
<td>15 (4.5)</td>
<td>30 (9.0)</td>
<td>90 (27.0)</td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>Plain Glass</td>
<td>15 (4.5)</td>
<td>30 (9.0)</td>
<td>90 (27.0)</td>
<td></td>
</tr>
<tr>
<td>Between Pallet Piles</td>
<td>None</td>
<td>7.5 (2.3)</td>
<td>15 (4.5)</td>
<td>45 (13.5)</td>
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</tr>
<tr>
<td>Other on-site storage</td>
<td>None</td>
<td>7.5 (2.3)</td>
<td>15 (4.5)</td>
<td>45 (13.5)</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 315.7.6(b)
Separation Distance between Plastic Pallet Stacks and Buildings

<table>
<thead>
<tr>
<th>Wall Construction</th>
<th>Type of Wall</th>
<th>Masonry</th>
<th>Plastic Pallet Separation Distance, ft (m)</th>
<th>Plastic Pallet Separation Distance, ft (m)</th>
<th>Plastic Pallet Separation Distance, ft (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall Construction</td>
<td>Window Openings</td>
<td>None</td>
<td>Pallets</td>
<td>51 to 200 Pallets</td>
<td>&gt;200 Pallets</td>
</tr>
<tr>
<td>Masonry</td>
<td>Wired glass Fire-rated glazing with Open Sprinklers</td>
<td>10 (3.0)</td>
<td>20 (6.0)</td>
<td>50 (15.0)</td>
<td></td>
</tr>
<tr>
<td>Masonry</td>
<td>Wired glass Fire-rated Glazing</td>
<td>15 (4.5)</td>
<td>40 (12.0)</td>
<td>100 (30.0)</td>
<td></td>
</tr>
<tr>
<td>Masonry</td>
<td>Plain Glass with Open Sprinklers</td>
<td>15 (4.5)</td>
<td>40 (12.0)</td>
<td>100 (30.0)</td>
<td></td>
</tr>
<tr>
<td>Noncombustible</td>
<td>None</td>
<td>15 (4.5)</td>
<td>40 (12.0)</td>
<td>100 (30.0)</td>
<td></td>
</tr>
<tr>
<td>Wood with Open Sprinklers</td>
<td>Wired glass Fire-rated glazing with Open Sprinklers</td>
<td>15 (4.5)</td>
<td>40 (12.0)</td>
<td>100 (30.0)</td>
<td></td>
</tr>
<tr>
<td>Wood</td>
<td>None</td>
<td>30 (9.0)</td>
<td>80 (24.0)</td>
<td>150 (45.0)</td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>Plain Glass</td>
<td>30 (9.0)</td>
<td>80 (24.0)</td>
<td>150 (45.0)</td>
<td></td>
</tr>
<tr>
<td>Between Pallet Piles</td>
<td>None</td>
<td>15 (4.5)</td>
<td>40 (12.0)</td>
<td>75 (22.5)</td>
<td></td>
</tr>
<tr>
<td>Other on-site storage</td>
<td>None</td>
<td>15 (4.5)</td>
<td>40 (12.0)</td>
<td>75 (22.5)</td>
<td></td>
</tr>
</tbody>
</table>

**Commenter's Reason:** The purpose of this proposal is not to make any technical changes. It simply replaces the reference to the out of date term “wired glass” with a reference to “Fire-rated glazing” which is the current correct technical term to be utilized. The term wired glazing has been systematically removed and replaced in the codes over the last several cycles.
Proponent: Jeffrey Shapiro, International Code Consultants, representing Tyco Fire Protection Products (jeff.shapiro@intlcodeconsultants.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

### TABLE 315.7.6(a)
Separation Distance between Wood Pallet Stacks and Buildings

<table>
<thead>
<tr>
<th>Wall Construction</th>
<th>Wood Pallet Separation Distance, ft (m)</th>
<th>Wood Pallet Separation Distance, ft (m)</th>
<th>Wood Pallet Separation Distance, ft (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wall Construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of Wall</td>
<td>Window Openings</td>
<td>≤ 50 Pallets</td>
<td>51 to 200 Pallets</td>
</tr>
<tr>
<td>Masonry</td>
<td>None</td>
<td>2 (0.6)</td>
<td>2 (0.6)</td>
</tr>
<tr>
<td>Masonry</td>
<td>Wired Glass with Open Approved Deluge Window Sprinklers</td>
<td>2 (0.6)</td>
<td>5 (1.5)</td>
</tr>
<tr>
<td>Masonry</td>
<td>Wired Glass</td>
<td>10 (3.0)</td>
<td>5 (1.5)</td>
</tr>
<tr>
<td>Masonry</td>
<td>Plain Tempered Glass with Open Approved Deluge Window Sprinklers</td>
<td>10 (3.0)</td>
<td>5 (1.5)</td>
</tr>
<tr>
<td>Noncombustible</td>
<td>None</td>
<td>10 (3.0)</td>
<td>5 (1.5)</td>
</tr>
<tr>
<td>Wood with Open Sprinklers</td>
<td>10 (3.0)</td>
<td>5 (1.5)</td>
<td>20 (6.0)</td>
</tr>
<tr>
<td>Wood</td>
<td>None</td>
<td>15 (4.5)</td>
<td>30 (9.0)</td>
</tr>
<tr>
<td>Any</td>
<td>Plain Glass</td>
<td>15 (4.5)</td>
<td>30 (9.0)</td>
</tr>
<tr>
<td>Between Pallet Piles</td>
<td>7.5 (2.3)</td>
<td>15 (4.5)</td>
<td>45 (13.5)</td>
</tr>
<tr>
<td>Other on-site storage</td>
<td>7.5 (2.3)</td>
<td>15 (4.5)</td>
<td>45 (13.5)</td>
</tr>
</tbody>
</table>

### TABLE 315.7.6(b)
Separation Distance between Plastic Pallet Stacks and Buildings

<table>
<thead>
<tr>
<th>Wall Construction</th>
<th>Plastic Pallet Separation Distance, ft (m)</th>
<th>Plastic Pallet Separation Distance, ft (m)</th>
<th>Plastic Pallet Separation Distance, ft (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wall Construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of Wall</td>
<td>Window Openings</td>
<td>Pallets</td>
<td>51 to 200 Pallets</td>
</tr>
<tr>
<td>Masonry</td>
<td>None</td>
<td>2 (0.6)</td>
<td>2 (0.6)</td>
</tr>
<tr>
<td>Masonry</td>
<td>Wired Glass with Open Approved Deluge Window Sprinklers</td>
<td>10 (3.0)</td>
<td>20 (6.0)</td>
</tr>
<tr>
<td>Masonry</td>
<td>Wired Glass</td>
<td>15 (4.5)</td>
<td>40 (12.0)</td>
</tr>
<tr>
<td>Masonry</td>
<td>Plain Tempered Glass with Open Approved Deluge Window Sprinklers</td>
<td>15 (4.5)</td>
<td>40 (12.0)</td>
</tr>
<tr>
<td>Noncombustible</td>
<td>None</td>
<td>15 (4.5)</td>
<td>40 (12.0)</td>
</tr>
<tr>
<td>Wood with Open Sprinklers</td>
<td>15 (4.5)</td>
<td>40 (12.0)</td>
<td>100 (30.0)</td>
</tr>
<tr>
<td>Wood</td>
<td>None</td>
<td>30 (9.0)</td>
<td>80 (24.0)</td>
</tr>
<tr>
<td>Any</td>
<td>Plain Glass</td>
<td>30 (9.0)</td>
<td>80 (24.0)</td>
</tr>
<tr>
<td></td>
<td>Between Pallet Piles</td>
<td>Other on-site storage</td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------</td>
<td>-----------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 (4.5)</td>
<td>15 (4.5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 (12.0)</td>
<td>40 (12.0)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>75 (22.5)</td>
<td>75 (22.5)</td>
<td></td>
</tr>
</tbody>
</table>

**Commenter's Reason:** Standard spray and sidewall sprinklers are not tested for use in protecting glazed openings. Testing has shown that special window sprinklers are uniquely capable of providing a uniform discharge pattern over glazing to avoid glass breakage and provide equivalent longevity to a fire assembly. In addition, open sprinklers are better described as "deluge," and fire testing indicates that plain (plate) glass will not survive a fire exposure, even with sprinkler protection. The recommended revisions address these concerns.
Committee Action: Approved as Modified

Proponent: Daniel Nichols, New York State Division of Building Standards and Codes, representing New York State Division of Building Standards and Codes (dnichols@dos.state.ny.us)

2015 International Fire Code

315.3.1 Ceiling clearance. Storage shall be maintained 2 feet (610 mm) or more below the ceiling in nonsprinklered areas of buildings or not less than 18 inches (457 mm) below sprinkler head deflectors in sprinklered areas of buildings.

Exception: The 2 foot ceiling clearance is not required for storage along walls in nonsprinklered areas of buildings.

Reason: The limitation of storage heights in unsprinklered spaces is to address the ability for firefighters to direct hose streams over stored materials to extinguish fires in other spaces within a room. However, the storage of materials along the wall does not impede this ability.

The installation of built-in combustible cabinetry, such as wall-mounted cabinets without doors, is not prohibited by the section. The arrangement of the storage should not be regulated differently if it is in fixed cabinets or on shelves since the fire hazard does not change.

This proposal will assist fire code officials that routinely question whether the arrangement of storage along walls is permitted or not permitted because of the type of shelving or cabinetry the storage is located on.

Cost Impact: Will not increase the cost of construction
This is a maintenance issue and will not effect the cost of construction.

Public Hearing Results

Modification:

315.3.1 Ceiling clearance. Storage shall be maintained 2 feet (610 mm) or more below the ceiling in nonsprinklered areas of buildings or not less than 18 inches (457 mm) below sprinkler head deflectors in sprinklered areas of buildings.

Exception Exceptions: The

1. The 2 foot ceiling clearance is not required for storage along walls in nonsprinklered areas of buildings.
2. The 18 inch ceiling clearance is not required for storage along walls in sprinklered buildings where in accordance with Section 903.3.1.1.

Committee Reason: This proposal was approved as it recognizes that the concern of suppression along the walls is not the same as that in the middle of the room. The hose streams do not need to go over the storage along the wall. The modification more comprehensively deals with both unsprinklered and sprinklered buildings. NFPA 13 has specific allowances that are addressed by this modification.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O’Brian representing Fire Code Action Committee (fcac@iccSAFE.org); Jeff Hugo, representing National Fire Sprinkler Association (hugo@nfsa.org) requests Approve as Modified by this Public Comment.

Further Modify as Follows:

2015 International Fire Code

315.3.1 Ceiling clearance. Storage shall be maintained 2 feet (610 mm) or more below the ceiling in nonsprinklered areas of
buildings or not less than 18 inches (457 mm) below sprinkler head deflectors in sprinklered areas of buildings.

Exceptions:
1. The 2 foot ceiling clearance is not required for storage along walls in nonsprinklered areas of buildings.
2. The 18 inch ceiling clearance is not required for storage along walls in sprinklered areas of buildings where in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.

Commenter's Reason: This public comment addresses concerns brought up in discussion with the committee. First it addresses storage areas when protected by NFPA 13R and NFPA 13D systems. Second, the public comment addresses an oversight in the language of #2. It correlates with the charging text and #1 by adding "...sprinklered areas of buildings..". This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Proponent: Albert Rood, representing Self (al.rood@wyo.gov) requests Disapprove.

Commenter's Reason: 315.3.1 Ceiling Clearance.
The exceptions proposed are creating an avenue to defeat the intent of limiting the combustibles stored in areas that would in turn contribute to the fire load conditions present.
F20-16
IFC: 315.3.2.

**Proposed Change as Submitted**

**Proponent**: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

**2015 International Fire Code**

Revise as follows:

315.3.2 Means of egress. Combustible materials shall not be stored in exits or exits; enclosures for stairways, stairways, and ramps; or exit access corridors serving an occupant load of 30 or more.

**Reason**: So as to not lose a good idea, this proposal takes another approach to what was attempted by Proposal F16-13, submitted by the ICC Fire Code Action Committee and seeking to place a restriction on storage in exit access corridors. It should be noted that the term "exit access corridor" appears in italics, as it does in other places in the code where it has been used, because the terms "exit access" and "corridor" are defined. The combined term is not.

Not having some restriction on combustible storage in exit access corridors is a significant hole in the IFC that has directly contributed to past multiple-fatality fires. Last cycle, the Fire Code Committee cited Section 1020 as an existing section of the code that adequately addresses this concern, but that is not correct. Section 1020 does address maintaining the required minimum width, but it does not address the concern of combustible materials in an exit access corridor which, if ignited, will cause the corridor to be unusable as a means of egress regardless of whether the physical dimension of minimum corridor width was reduced by the stored material. The committee statement also expressed concern about a lack of clarity associated with the term "stored," but this term is already in the existing code text that is applicable to exits and stairway/ramp enclosures. This proposal simply continues to use the existing term.

This issue originated as a result of rolled carpet, padding and adhesive being stored in the corridor of a hotel where ICC was holding committee meetings. The hotel was being remodeled. Fire code officials who were present at the meeting were concerned about the risk that this storage created, and we looked for a code section that could be cited as a basis for asking management to remove these materials from the exit access corridor. To our surprise, we couldn't come up with any such requirement in the IFC to address the issue (although many of us were sure that there must be one somewhere).

It is understood that the committee had some heartburn with last cycle's proposal targeting all corridors, and this proposal takes a different approach. The basis of applying this provision to exit access corridors serving 30 or more occupants is an attempt to find a "reasonable" threshold for the requirement, avoiding broad application to all corridors. IFC Table 1020.1 was used as a guide. It establishes corridor fire-resistance thresholds, which indicate that an increased level of safety is warranted for the means of egress, and the occupant load of 30 was considered to be a reasonable trigger from that table for corridor storage regulations.

**Cost Impact**: Will not increase the cost of construction

The proposal deals with use of existing buildings and does not affect construction.

F20-16 : 315.3.2-
SHAPIRO13044

**Public Hearing Results**

**Committee Action**: Disapproved

**Committee Reason**: The proposal, though the concept was appreciated, was disapproved based upon concerns for proposal being overly restrictive. Storage is not defined and additionally this may cause a conflict where lobbies are permitted to be part of the corridor.

**Assembly Action**: None

**Individual Consideration Agenda**

**Public Comment 1**:

**Proponent**: Gregory Keith, representing The Boeing Company (grkeith@mac.com) requests Approve as Modified by this Public Comment.
Modify as Follows:

2015 International Fire Code

315.3.2 Means of egress. Combustible materials shall not be stored in exits, enclosures for stairways and ramps, or exit access corridors serving an occupant load of 30 or more.

3311.2.1 Combustible materials In occupied buildings, combustible construction materials shall not be stored in exits, enclosed exit stairways and ramps and corridors.

Commenter's Reason: The proposal as submitted was too broad brushed in its scope. It was intended to prohibit the storage of combustible construction materials in corridors. As written however, it prohibited the storage of any combustible material in a corridor. Where combustible materials should not be stored in an exit component, a corridor is an exit access component similar to an aisle. Fuel loading is assumed in the functional exit access portion of the means of egress system. For example, it is not uncommon to have file cabinets containing combustible documents within the non-required width of corridors.

In its published reason statement for disapproval of Item F20-16, the IFC Committee noted that the proponent's concept was appreciated. This public comment places the provision in the proper location, Section 3311.2, means of egress maintenance.

The proper location of the requirement addresses the proponent's concern and maintains the status quo for the storage of combustible materials within the exit access portion of the means of egress system.

Public Comment 2:

Proponent: Jeffrey Shapiro, International Code Consultants, representing Self (jeff.shapiro@intlcodeconsultants.com) requests Approve as Modified by this Public Comment.

Replace Proposal as Follows:

2015 International Fire Code

315.3.2 Means of egress. Combustible materials shall not be stored in exits or enclosures for stairways and ramps. Combustible materials in the means of egress during construction, demolition, remodeling or alterations shall comply with Section 3311.3.

3311.3 Storage. Combustible materials associated with construction, demolition, remodeling or alterations to an occupied structure shall not be stored in exits, enclosures for stairways and ramps, or exit access corridors serving an occupant load of 30 or more.

Exceptions:
1. Where the only occupants are construction workers.
2. Combustible materials that are temporarily accumulated to support work being performed when workers are present.

Commenter's Reason: Based on feedback provided at the Louisville hearings, there was significant support for regulating materials in exit access corridors related to construction work. In the tireless quest to get the IFC to at least partially address this issue, this public comment attempts to secure at least a partial fix that was supported in concept and is specifically related to the original justification. The terms “construction, demolition, remodeling and alterations” are copied from the existing text in the preceding paragraph (3311.2) on general maintenance of the means of egress for Chapter 33 and were selected for correlation vs. trying to use IEBC text.
Proposed Change as Submitted

Proponent: Michael O'Brien representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code

Add new text as follows:

**105.6.49 Mobile Food Preparation Vehicles** A permit is required for mobile food preparation vehicles equipped with appliances that produce smoke or grease laden vapors.

Add new definition as follows:

**SECTION 202 DEFINITIONS**

**MOBILE FOOD PREPARATION VEHICLES.** Vehicles that contain cooking equipment that produce smoke or grease laden vapors for the purpose of preparing and serving food to the public. Vehicles intended for private recreation shall not be considered mobile food preparation vehicles.

Add new text as follows:

**SECTION 319 MOBILE FOOD PREPARATION VEHICLES**

319.1 General. *Mobile food preparation vehicles* that are equipped with appliances that produce smoke or grease laden vapors shall comply with this section.

319.2 Permit Required. Permits shall be required as set forth in Section 105.6.

319.3 Exhaust hood. Cooking equipment that produces grease laden vapors shall be provided with a kitchen exhaust hood in accordance with Section 609.

319.4 Fire protection. Fire protection shall be provided in accordance with Section 319.4.1 through 319.4.2.

319.4.1 Fire protection for cooking equipment. Cooking equipment shall be protected by automatic fire extinguishing systems in accordance with Section 904.12.

319.4.2 Fire extinguisher. Portable fire extinguishers shall be provided in accordance with Section 904.12.5.

319.5 Appliance connection to fuel supply piping. Gas cooking appliances shall be secured in place and connected to fuel supply piping with an appliance connector complying with ANSI Z21.69/CSA 6.16. The connector installation shall be configured in accordance with manufacturer's installation instructions. Movement of appliances shall be limited by restraining devices installed in accordance with the connector and appliance manufacturer's instructions.

319.6 Cooking oil storage containers. Cooking oil storage containers within *mobile food preparation vehicles* shall have a maximum aggregate volume not to exceed 120 gallons (454 L), and shall be stored in such a way as to not be toppled or damaged during transport.

319.7 Cooking oil storage tanks. Cooking oil storage tanks within *mobile food preparation vehicles* shall comply with Section 319.7.1 through 319.7.5.

319.7.1 Metallic storage tanks. Metallic cooking oil storage tanks shall be listed in accordance with UL 142 or UL 80, and shall be installed in accordance with the tank manufacturer's instructions.

319.7.2 Nonmetallic storage tanks. Nonmetallic cooking oil storage tanks shall be installed in accordance with the tank manufacturer's instructions and shall also comply with all of the following:

1. Tanks shall be listed for use with cooking oil, including maximum temperature to which the tank will be exposed during use.
2. Tank capacity shall not exceed 200 gallons (757 L) per tank.

319.7.3 Cooking oil storage system components. Metallic and nonmetallic cooking oil storage system components shall include but are not limited to piping, connections, fittings, valves, tubing, hose, pumps, vents and other related components used for the transfer of cooking oil.

319.7.4 Design criteria. The design, fabrication and assembly of system components shall be suitable for the working pressures, temperatures and structural stresses to be encountered by the components.

319.7.5 Tank venting. Normal and emergency venting shall be provided for cooking oil storage tanks.

319.7.5.1 Normal vents. Normal vents shall be located above the maximum normal liquid line, and shall have a minimum
effective area not smaller than the largest filling or withdrawal connection. Normal vents are not required to vent to the exterior.

319.7.5.2 Emergency vents. Emergency relief vents shall be located above the maximum normal liquid line, and shall be in the form of a device or devices that will relieve excessive internal pressure caused by an exposure fire. For nonmetallic tanks, the emergency relief vent shall be allowed to be in the form of construction. Emergency vents are not required to discharge to the exterior.

319.8 LP-gas systems. Where LP-gas systems provide fuel for cooking appliances, such systems shall comply with Chapter 61 and Sections 319.8.1 through 319.8.5.

319.8.1 Maximum aggregate volume. The maximum aggregate capacity of LP-gas containers transported on the vehicle and used to fuel cooking appliances only shall not exceed 200 pounds propane capacity.

319.8.2 Protection of container. LP-gas containers installed on the vehicle shall be securely mounted and restrained to prevent movement.

319.8.3 LP-gas container construction. LP-gas containers shall be manufactured in compliance with the requirements of NFPA 58.

319.8.4 Protection of system piping. LP-gas system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage, and damage from vibration.

319.8.5 LP-gas alarms. A listed LP-gas alarm shall be installed within the vehicle in the vicinity of LP-gas system components, in accordance with manufacturer's instructions.

319.9 CNG Systems. Where CNG systems provide fuel for cooking appliances, such systems shall comply with Sections 319.9.1 through 319.9.4.

319.9.1 CNG containers supplying only cooking fuel. CNG containers installed solely to provide fuel for cooking purposes shall be in accordance with Sections 319.9.1.1 through 319.9.1.3.

319.9.1.1 Maximum Aggregate Volume. The maximum aggregate capacity of CNG containers transported on the vehicle shall not exceed 1,300 pounds water capacity.

319.9.1.2 Protection of container. CNG containers shall be securely mounted and restrained to prevent movement. Containers shall not be installed in locations subject to a direct vehicle impact.

319.9.1.3 CNG container construction. CNG containers shall be a NGV-2 cylinder.

319.9.2 CNG containers supplying transportation and cooking fuel. Where CNG containers and systems are used to supply fuel for cooking purposes in addition to being used for transportation fuel, the installation shall be in accordance with NFPA 52.

319.9.3 Protection of system piping. CNG system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage, and damage from vibration.

319.9.4 Methane alarms. A listed methane gas alarm shall be installed within the vehicle in accordance with manufacturer's instructions.

319.10 Maintenance. Maintenance of systems on mobile food preparation vehicles shall be in accordance with Sections 319.10.1 through 319.10.3.

319.10.1 Exhaust system. The exhaust system, including hood, grease-removal devices, fans, ducts and other appurtenances, shall be inspected and cleaned in accordance with Section 609.3.

319.10.2 Fire protection systems and devices. Fire protection systems and devices shall be maintained in accordance with Section 901.6.

319.10.3 Fuel-gas systems. LP-gas containers containers installed on the vehicle and fuel-gas piping systems shall be inspected annually by an approved inspection agency or a company that is registered with the U.S. Department of Transportation to requalify LP-gas cylinders, to ensure that system components are free of damage, suitable for the intended service and not subject to leaking. CNG containers shall be inspected every three years in a qualified service facility. CNG containers shall not be used past their expiration date as listed on the manufacturer's container label. Upon satisfactory inspection, the approved inspection agency shall affix a tag on the fuel-gas system or within the vehicle indicating the name of the inspection agency and the date of satisfactory inspection.

Reason: This proposal addresses commercial mobile food preparation vehicles. Recent fire incidents have shown a need to regulate these vehicles. This proposal addresses concerns with the cooking operations and with the fuel systems for cooking appliances. With respect to cooking operations, this proposal relies heavily on existing IFC code sections from Chapter 6 and Chapter 9 in addressing fire suppression, fire extinguisher, appliance connection, and cooking oil storage tanks. Code language is added to address LP-gas and CNG, which are common fuel gas systems utilized on these vehicles. This proposal
addresses the maximum volume of fuel gas, fuel gas container construction, fuel gas system piping, and gas alarm sensors. In addition, this proposal sets forth a maintenance requirement for both LP-gas and CNG fuel gas systems, including the required schedule for inspection of fuel gas containers and fuel gas piping systems. Companion code proposals are submitted to add a definition of “Mobile Food Preparation Vehicle” and to add an operational permit requirement for mobile food preparation vehicles.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

**Cost Impact:** Will increase the cost of construction

This proposal will increase costs by requiring fire protection systems, standards for construction, permit fees, and maintenance costs, which have not been required in the past.

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**Individual Consideration Agenda**

**Public Comment 1:**

Proponent: Michael O’Brian representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as follows:

2015 International Fire Code

319.9.1.3 CNG container construction. The construction of CNG containers shall be a NGV 2 cylinder approved.

Commenter’s Reason: The original submittal required CNG cylinders to be NGV cylinders. However, the ANSI standard that addresses NGV cylinders was inadvertently not proposed to be added as a reference document. In order to avoid having a code requirement without proper reference, this proposal changes the language to require that the CNG cylinders be approved. This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)
Proposed Change as Submitted

Proponent: Michael O'Brian representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code
Revise as follows:

403.12.3 Crowd managers for gatherings exceeding 1,000 people. Where facilities or events involve a gathering of more than 1,000 people, crowd managers shall be provided in accordance with Sections 403.12.3.1 through 403.12.3.3.

403.12.3.1 Number of crowd managers. The minimum number of trained crowd managers shall be established at a ratio of one crowd manager for every 250 persons.

Exception: Where approved by the fire code official, the number of crowd managers shall be permitted to be reduced where the facility is equipped throughout with an approved automatic sprinkler system or based upon the nature of the event.

Exceptions:
1. Outdoor events with less than 1,000 persons in attendance
2. Assembly occupancies used exclusively for religious worship with an occupant load not exceeding 1,000.
3. The number of crowd managers shall be permitted to be reduced where, in the opinion of the fire code official, the fire protection provided by the facility and the nature of the event warrant a reduction.

Reason: This change does not require a facility to hire any additional personnel; rather, it requires that a requisite number of their staff receive approved training in fire prevention, evacuation methods, and other duties. This training is currently provided at little or no cost across the nation.

The current code has no requirement for crowd managers until the occupant load in a public assembly reaches 1,000, then the code requires five trained crowd managers for an occupant load of 1001. This is illogical, especially since one of the events that generated this requirement, the Station Nightclub Fire, had an occupant load of less than 500. Smaller venues sometimes place the public at greater risk than large ones for many reasons, including the fact that larger facilities have greater requirements for other fire protection features. NFPA 1 and NFPA 101 require crowd managers in all public assemblies (except churches), so approving this code change will bring the two regulations closer to conformity. This proposal is to change the threshold to an occupant load of 300, which is more reasonable, given this is the threshold for most sprinkler and alarm requirements in assembly occupancies (all except A-2 assemblies require sprinklers at an occupant load of 300; the threshold for A-2 occupancies is 100).

The exception for outdoor events with less than 1,000 is intended to recognize the fact that outdoor events are perceived to be less dangerous because egress isn't restricted in any way; The exception for places of worship with occupant loads up to 1,000 recognizes the fact that people who are in these places of assembly normally have a greater awareness of their surroundings, and are more familiar with egress routes because they attend the church on a more regular basis than those at performances, who tend to be more transient.

The formatting change to place the potential reduction in the number of crowd managers in an exception is editorial.

Finally the term “trained crowd managers” was inadvertently changed during the last cycle to drop the descriptor “trained” in a rewrite of this section for 2015. Reinserting the term “trained” emphasizes the requirement that crowd managers must receive approved training.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Cost Impact: Will not increase the cost of construction

This will not increase the cost of construction but may cost more to run some events. At the same time this revision keeps flexibility with the exceptions in Section 403.12.3.1 where such crowd managers are not warranted. As noted the cost of
Committee Action: Disapproved

Committee Reason: There were several concerns with this proposal. There was confusion on the criteria of 300 people requiring a crowd manager with criteria of one crowd manager per every 250 people. It was suggested that the occupancy types need to be addressed. For example a Group A2 occupancy where eating and drinking occur is much different than a high school gym. This section poses a problem for outdoor events where automatic sprinklers cannot be provided to reduce the number of crowd managers. The application of exceptions 1 and 2 in Section 403.12.3.1 was unclear as they appear better related to Section 403.12.3.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

403.12.3 Crowd managers. Where facilities or events involve a gathering of more than 300 500 people, crowd managers shall be provided in accordance with Sections 403.12.3.1 through 403.12.3.3.

403.12.3.1 Number of crowd managers. A minimum number of two trained crowd managers shall be established at a ratio of, but no less than one trained crowd manager for each 250 persons or portion thereof, shall be provided for the gathering.

Exceptions:
1. Outdoor events with less than 1,000 persons in attendance shall not require crowd managers.
2. Assembly occupancies used exclusively for religious worship with an occupant load not exceeding 1,000 shall not require crowd managers.
3. The number of crowd managers shall be permitted to be reduced where, in the opinion of the fire code official, the fire protection provided by the facility and the nature of the event warrant a reduction

Commenter's Reason: During the committee hearings, there were questions about the drop in code trigger and how to determine the correct number of crowd managers based on ratio. The original proposal included a reduced trigger of 300 persons, and did not differentiate whether to require an additional crowd manager for each portion of 250 occupants. This public comment proposes a more palatable trigger of 500 occupants, and clarifies that crowd managers are required at a ratio of 1 to 250 occupants or portion thereof.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Proponent: Thomas Daly, representing American Hotel & Lodging Association (tom.daly@thehscg.com) requests Disapprove.

Commenter's Reason: The Fire Code Committee's action was correct in several respects. The proposed change based solely on occupant loads fails to take into consideration the number and location of means of egress and the number of stories in such assembly occupancies both of which impact the speed and orderliness of evacuations, nor did the proposed
change consider the type of notification (voice or not) of the fire alarm and communication system. A revision to modify the proposal without addressing these issues still presents a flawed proposal. The proposed change should be disapproved.

Thomas G. Daly, MSc. CSP
Principal
The Hospitality Security Consulting Group, LLC
Representing the American Hotel & Lodging Association
Proposed Change as Submitted

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

2015 International Fire Code

SECTION 202 DEFINITIONS

MATERIAL SAFETY DATA SHEET (MSDS SDS). Information concerning a hazardous material which is prepared in accordance with the provisions of DOL 29 CFR Part 1910.1200 or in accordance with the provisions of a federally approved state OSHA plan.

Revise as follows:

407.2 Material-Safety Data Sheets. Material Safety Data Sheets (MSDS SDS) for all hazardous materials shall be either readily available on the premises as a paper copy, or where approved, shall be permitted to be readily retrievable by electronic access.

5001.2.1 Mixtures. Mixtures shall be classified in accordance with hazards of the mixture as a whole. Mixtures of hazardous materials shall be classified in accordance with nationally recognized reference standards; by an approved qualified organization, individual, or Material Safety Data Sheet (MSDS SDS); or by other approved methods.

5002.1 Definitions. The following terms are defined in Chapter 2:

- BOILING POINT
- CEILING LIMIT
- CHEMICAL
- CHEMICAL NAME
- CLOSED CONTAINER
- CONTAINER
- CONTROL AREA
- CYLINDER
- DAY BOX
- DEFLAGRATION
- DESIGN PRESSURE
- DETACHED BUILDING
- DISPENSING
- EXCESS FLOW CONTROL
- EXHAUSTED ENCLOSURE
- EXPLOSION
- FLAMMABLE VAPORS OR FUMES
- GAS CABINET
- GAS ROOM
- HANDLING
- HAZARDOUS MATERIALS
- HEALTH HAZARD
- IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH)
- INCOMPATIBLE MATERIALS
- LIQUID
- LOWER EXPLOSIVE LIMIT (LEL)
- LOWER FLAMMABLE LIMIT (LFL)
- MATERIAL SAFETY DATA SHEET (MSDS SDS)
- MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA
- NORMAL TEMPERATURE AND PRESSURE (NTP)
- OUTDOOR CONTROL AREA
- PERMISSIBLE EXPOSURE LIMIT (PEL)
- PESTICIDE
- PHYSICAL HAZARD
- PRESSURE VESSEL
- SAFETY CAN
- SECONDARY CONTAINMENT
SEGREGATED.
SOLID.
STORAGE, HAZARDOUS MATERIALS.
SYSTEM.
TANK, ATMOSPHERIC.
TANK, PORTABLE.
TANK, STATIONARY.
TANK VEHICLE.
UNAUTHORIZED DISCHARGE.
USE (MATERIAL).
VAPOR PRESSURE.

5003.4 Material Safety Data Sheets. Material
Safety Data Sheets (MSDS SDS) shall be readily available on the premises for hazardous materials regulated by this chapter.
Where a hazardous substance is developed in a laboratory, available information shall be documented.

Exception: Designated hazardous waste.

5101.3 Material Safety Data Sheets. Material
Safety Data Sheet (MSDS SDS) information for aerosol products displayed shall be kept on the premises at an approved location.

E103.2 Evaluation questions. The following are sample evaluation questions:

1. What is the material? Correct identification is important; exact spelling is vital. Check labels, MSDS SDS, ask responsible persons, etc.
2. What are the concentration and strength?
3. What is the physical form of the material? Liquids, gases and finely divided solids have differing requirements for spill and leak control and containment.
4. How much material is present? Consider in relation to permit amounts, maximum allowable quantity per control area (from Group H occupancy requirements), amounts that require detached storage and overall magnitude of the hazard.
5. What other materials (including furniture, equipment and building components) are close enough to interact with the material?
6. What are the likely reactions?
7. What is the activity involving the material?
8. How does the activity impact the hazardous characteristics of the material? Consider vapors released or hazards otherwise exposed.
9. What must the material be protected from? Consider other materials, temperature, shock, pressure, etc.
10. What effects of the material must people and the environment be protected from?
11. How can protection be accomplished? Consider:
   11.1 Proper containers and equipment.
   11.2 Separation by distance or construction.
   11.3 Enclosure in cabinets or rooms.
   11.4 Spill control, drainage and containment.
   11.5 Control systems—ventilation, special electrical, detection and alarm, extinguishment, explosion venting, limit controls, exhaust scrubbers and excess flow control.
   11.6 Administrative (operational) controls—signs, ignition source control, security, personnel training, established procedures, storage plans and emergency plans.

Evaluation of the hazard is a strongly subjective process; therefore, the person charged with this responsibility must gather as much relevant data as possible so that the decision will be objective and within the limits prescribed in laws, policies and standards.

It could be necessary to cause the responsible persons in charge to have tests made by qualified persons or testing laboratories to support contentions that a particular material or process is or is not hazardous. See Section 104.7.2 of the International Fire Code.

Reason: The 2015 IFC and the Occupational and Safety Health Administration (OSHA), have historically required “Material Safety Data Sheets” (MSDs) be readily available on the premises for hazardous materials. As of June 1, 2015, OSHA, through the HazCom 2012, requires chemical manufacturers and distributors to have completed the process of reclassifying hazardous chemicals, to have updated all their information to be in “Safety Data Sheet” (SDSs) and to bear labels in accordance with the formats found in the UNECE Globally Harmonized System of Classification and Labelling of Chemicals (GHS).
This proposal seeks to correlate the requirements in the IFC to those adopted by OSHA by replacing all references in the IFC to "Material Safety Data Sheets" (MSDSs) with references to "Safety Data Sheet" (SDSs).

Historical Information

The United Nations Economic Commission for Europe (UNECE), has long recognized that with the extensive global trade in chemicals there was a need to develop national programs to ensure their safe use, transport and disposal. They also recognized that an internationally-harmonized approach to classification and labelling would provide the foundation for such programs. Born out of the 1992 Earth Summit — at the UN Conference on Environment and Development (UNCED) — in Rio de Janeiro, the GHS was expressly called for in the UNCED's 'International Mandate,' "A globally harmonized classification and compatible labelling system, including material safety data sheets and easily understandable symbols, should be available, if feasible, by the year 2000.

Thus the UNECE created the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) – with the first edition adopted in December 2002 and published in 2003. The new system — commonly referred to as GHS, addresses classification of chemicals by types of hazard and proposes harmonized hazard communication elements, including labels and safety data sheets. It aims at ensuring that information on physical hazards and toxicity from chemicals be available in order to enhance the protection of human health and the environment during the handling, transport and use of these chemicals. The GHS also provides a basis for harmonization of rules and regulations on chemicals at national, regional and worldwide level, an important factor also for trade facilitation. (Source: http://www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html)

OSHA in the previous regulations, known as HazCom 1994, did not mandate a specific format for MSDSs, therefore a number of different MSDS styles and formats were used in US. The 2 most common formats for an MSDS was the 8 section OSHA format, or the 16 section ANSI format (ANSI Z400.1-1993). In HazCom 2012, the format for an SDS is mandated by GHS to be a 16 section format:

Section 1: Identification
Section 2: Hazard(s) Identification
Section 3: Components / Information on Ingredients
Section 4: First-Aid Measures
Section 5: Fire-Fighting Measures
Section 6: Accidental Release Measures
Section 7: Handling and Storage
Section 8: Exposure Controls / Personal Protection
Section 9: Physical and Chemical Properties
Section 10: Stability and Reactivity
Section 11: Toxicological Information
Section 12: Ecological Information
Section 13: Disposal Considerations
Section 14: Transport Information
Section 15: Regulatory Information
Section 16: Other Information

Correlative code changes are also being proposed to IFC Sections 202, 5001.2.1, 5003.4, 5101.3 and E103.2.

Cost Impact: Will not increase the cost of construction
This is simply a correlation in terminology.
SAFETY DATA SHEET (SDS). Information concerning a hazardous material which is prepared in accordance with the provisions of DOL 29 CFR Part 1910.1200 or in accordance with the provisions of a federally approved state OSHA plan.

A document titled as a Material Safety Data Sheet (MSDS) is equivalent to an SDS for the purposes of this code.

Committee Reason: Although the committee approved F4-16 which would simply acknowledge SDS's in the definition to MSDS this proposal was also approved. This proposal addresses the term SDS throughout the IFC. The concern initially was that the terminology of MSDS cannot be lost for existing buildings. Based upon that concern a modification was made to simply include MSDS in the definition of SDS. This proposal and action of approval as submitted is the opposite of that taken on code change proposal F4-16. This proposal with modification was felt to be a better strategy.

Assembly Action: None

Analysis: Note that code change proposal F4-16 and F34-16 have opposing approaches and both were approved.

Individual Consideration Agenda

Proponent: Michael O’Brien representing Fire Code Action Committee (fcac@iccsafe.org) requests Disapprove.

Commenter’s Reason: Proposals F4-16 and F34-16 were both approved in Louisville, and both introduced references to Safety Data Sheets (SDS). However, the two proposals accomplished this in different ways that cannot coexist in the code. We preferred the more concise proposal included in F4-16, and thus are requesting disapproval for this proposal.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

F34-16
Proposed Change as Submitted

Proponent: Stephen Skalko, representing Masonry Alliance for Codes and Standards (svskalko@cox.net)

2015 International Fire Code

Revise as follows:

503.1.2 Additional access. The fire code official is authorized to require more than one fire apparatus access road based on the potential for impairment of a single road by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access in accordance with Sections 503.1.2.1 and 503.1.2.2.

503.1.2.1 Access Impairment. Additional fire department apparatus access as needed based on the potential for impairment of a single road by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

503.1.2.2 Buildings of Type III, IV and V construction. Buildings of Type III, IV and V construction that are four or more stories in height shall be provided with not less than two fire apparatus access roads complying with Section 503. The termination point of the fire apparatus access roads on the building site shall be placed a distance apart not less than one-third of the length of the maximum overall diagonal dimension of the building or area to be served as measured in a straight line.

Reason: As buildings of Type III, IV and V construction are being built to taller heights as allowed in Tables 504.3 and 504.4 of the International Building Code, they are representing a significant challenge for the fire service in responding to and attempting to extinguish or control the burning of the combustible structure, especially at the higher structure heights. In addition, these buildings of combustible material necessitate response by larger numbers of fire fighters and fire apparatus. This is evident by the fires that have occurred in recent years for buildings of combustible framing under construction.

A recent example is a major fire in Los Angeles with five stories of wood framing over a two story concrete podium on December 8, 2014. The apartment building known as the DaVinci required more than 250 firefighters to be dispatched to the scene. Access to parts of the building under fire was limited by the site layout. The size and the effects of the fire forced the closure of northbound Harbor (110) Freeway to the northbound 101 Freeway until 10 a.m.

Other recent large buildings framed with combustible materials that experienced fires and presented significant challenges for the fire service include:

Project Name / Location: Lindell Avenue Apartments, St. Louis, MO
Date of Incidents: June 13, 2007 and July 18, 2012
Project Description: 4 story, 197-unit, wood framed apartment building.
Building Status: Completed and occupied.
This same wood framed building was the scene of a 2007 fire that caused $12 million in damage while construction was underway.

Project Name / Location: 550 East and 500 South, Salt Lake City, UT
Date of Incident: February 9, 2014
Project Description: 4-story, wood frame apartment complex
Building Status: Under construction
The fire caused $2.5 million in damage.

Project Name / Location: Axis Apartments, Houston, TX
Date of Incident: March 25, 2014
Project Description: 5 story, 396 unit wood-framed apartment building
Building Status: Under construction
The fire incident began as a 3-alarm fire at 12:30 p.m. but was upgraded to a 5-alarm fire in less than an hour. More than 400 Houston Fire Department personnel responded.

Project Name / Location: Apollo Way, Madison, WI
Date of Incident: August 8, 2014
Project Description:  4-story, 105-unit wood-frame apartment complex.

Building Status: Under construction

Authorities initially said the fire caused $3.5 million to $5 million in damage, but later the insurer estimated that damage is "upwards of $10 million."

Besides the fires listed above, a recent fire in the Belleza condominium complex at Ponte Vedra Beach, Florida on July 13, 2015, is another example of the need for adequate access to these types of buildings. After the fire was under control St. Johns County Fire-Rescue Capt. Jeremy Robshaw was quoted as saying ""We had a heavy fire load upon arrival, so we were essentially playing catch up as soon as we got here. The location of the building, while one side gives us good access, the opposite side of the structure, essentially, there's very little access. The other building is very close to it, so it's difficult for us to get back there. That is where the main body of the fire was located. So really one of our primary objectives, initially, was accessing that area and then preventing the adjacent structure from becoming involved." [http://www.news4jax.com/news/fire-causes-evacuation-at-timberwalk-apartments/34127358 (http://www.news4jax.com/news/fire-causes-evacuation-at-timberwalk-apartments/34127358)].

This proposal will require at least two (2) fire apparatus access roads be provided for fire department use to stage an exterior fire attack on these taller buildings of combustible construction. More than one fire department access road to these types of buildings is essential to assist the fire service in responding to and possibly gaining early control of the fire incident. Also, to insure reasonable remoteness of the location of these access roads on site they are also being required to be placed a distance equal to 1/3 the overall diagonal of the building or area. This concept is similar to criteria for remoteness of exits and exit access in Section [BE] 1007.1.1.

If a fire should occur two (2) fire department apparatus access roads remotely located give the fire service ample opportunity to respond, adequately stage a fire attack on the structure and reduce the risk of fire spread to other properties to an acceptable level.

Cost Impact: Will increase the cost of construction

This proposal is expected to increase the cost of construction due to the additional fire department apparatus roads required on site. This increased cost however is necessary to reduce the risk of damage to adjacent properties due to fire exposure and provide the fire service with improved access for firefighting response to these taller combustible buildings.

Public Hearing Results

Committee Action: Disapproved

Committee Reason: This proposal inappropriately uses overly restrictive fire department vehicle access requirements to penalize combustible construction.

Assembly Action: None

Individual Consideration Agenda

Proponent : Stephen Skalko, representing Masonry Alliance for Codes and Standards (svskalko@cox.net) requests Approve as Submitted.

Commenter's Reason: The incidences of fire in buildings of combustible types of construction during the building phase have been increasing in recent years. The reason statement in the original proposal documented five complexes that burned in 2014 and 2015. The fire department's ability to stage an effective fire attack to limit the damage from the fires to the structure of origin and to prevent fire spread to other buildings were hampered in some case due to limited on-site access. This proposal recognizes this deficiency and proposes two fire department vehicle access points remotely located for these types of buildings.

The committee reason for disapproval suggests the proposal penalizes combustible construction. However, that is not the case. The proposal actually recognizes, based on the increase in recent fire incidences, that buildings which use combustible...
materials for most of the structure present a much higher risk for experiencing a sizeable fire due to fire load of the materials. This in turn, creates a bigger challenge for the fire service to perform an exterior attack to control the fire and limit damage to the building and surrounding buildings/property. Accordingly, buildings of this type necessitate consideration of additional fire department vehicle access.

Recommend approval as submitted.
Committee Action: Disapproved

Assembly Action: None

Proposed Change as Submitted

Proponent: Ali Fattah, City of San Diego Development Services Department (afattah@sandiego.gov)

2015 International Fire Code

Revise as follows:

508.1.2 (IBC [F] 911.1.2) Separation. The fire command center shall be separated from the remainder of the building by not less than a 1-hour fire barrier constructed in accordance with Section 707 of the International Building Code or horizontal assembly constructed in accordance with Section 711 of the International Building Code, or both. Where the fire command center is required by Section 403.4.6 of the International Building Code, it shall be separated from the remainder of the building by not less than a 2-hour fire barrier or horizontal assembly, or both.

Reason: This code change is mainly editorial in nature and coordinates the IBC/IFC with the requirements in NFPA 72. The majority of high rise buildings utilize zoned evacuation. NFPA 72 is a referenced standard and it requires that zoned (or partial) evacuation systems meet survivability requirements. This entails that the fire alarm riser and all equipment serving the main backbone of the system (prior to branching off on each floor) being protected as specified in NFPA 72. Survivability is achieved via a 2-hour rated room or enclosure per 2013 NFPA 72 Section 24.4.2.8.5.6. Since IBC Section 911.1.5 requires that the emergency voice/alarm communications system control unit be in the fire command center, this is equipment that is required to meet the survivability requirements of NFPA 72. Therefore, the room must be separated by at least 2-hour rated fire barriers per NFPA 72.

The intent of this change is to incorporate the referenced standard requirement from NFPA 72 into the IBC so that they are consistent and there is no confusion. The cost of this change is minimal as the fire command center is only 200 square feet in area so the added layer of drywall and an upgrade to a 90-minute rated door should not be cost restrictive.

Additionally, Section 913.2.1 requires that fire pump rooms be separated with two hour assemblies and Section 403.4.8.1 requires that the emergency or standby generator room also be separated with two hour assemblies it stands to reason that the fire command center that controls these systems should be similarly separated.

The proposed code change assumes that Group A code change G76-15 will be approved through public comment # 1 or 2 as a result the text of the proposed code change is reflective of that. In the even that G76-15 is not approved then we request that the code correlating committee revise the fire resistance rating to 2 hour in the first sentence of the unchanged Section and that the additional proposed text be omitted.

Cost Impact: Will increase the cost of construction
This requirement is a life safety related issue. The cost increase will not be significant since it involves the incremental cost of increased fire resistance on a very large project.

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The committee felt the requiring a 2 hour separation versus 1 hour was overly restrictive and unnecessary.

Assembly Action: None

Individual Consideration Agenda

Proponent: Ali Fattah, City of San Diego Development Services Department, representing City of San Diego Development Services Department (afattah@sandiego.gov) requests Approve as Submitted.

Commenter's Reason: We request approval as submitted for the proposed code change that addresses an inconsistency in requirements triggered by NFPA 72 and implemented in the IBC. The survivability requirements have evolved over several code cycles and the NFPA 72 required fire resistance to protect “pathways” for survivability from fire in “a 2 hour enclosure, or protected area”, applies from the origin to the termination of the pathway. The pathway leads to the fire command center so it stands to reason that equal protection is required.
A speaker in opposition stated that he disagreed with the NFPA standard and that the increased cost resulting from approval of the proposed code change were not necessary.

It is important to keep in context the construction cost increase of a room constructed in a multi-million dollar high-rise building project as proposed is not significant since the door (a one hour door can be labeled as a 90 minute door if hardware complies) and fire dampers (2 hour one and 2 hour wall dampers are the same) will be the same and the cost of an additional layer of Type X drywall or substitution to a thicker type of drywall assembly is not significant.
Proposed Change as Submitted

Proponent: Stephen DiGiovanni, Clark County Building Department, representing Southern Nevada Chapter of ICC
(sdigiovanni@clarkcounty nv.gov)

2015 International Fire Code

508.1.3 (IBC [F] 911.1.3) Size. The fire command center shall be not less than 200-0.015 percent of the total building area of the facility served or 96 square feet (9.0 m²) in area, whichever is greater, with a minimum dimension of 10-0.7 times the square root of the room area, or 8 feet (2438 mm), whichever is greater.

Reason: From the 2006 IBC to the 2009 IBC, the Fire Command Center size increased from 96 sf to 200 sf, and the minimum dimension increased from 8 ft to 10 ft.

It is clear that one Fire Command Center size does not address all building scenarios. This issue may be better addressed by a Fire Command Center size that is variable. For smaller buildings, which are expected to have fewer panels for fire alarm, stair pressurization controls, HVAC controls, smoke removal, elevator status, etc., the size of 200 sf from the current code may be more than needed. It is probable that the original size requirement of 96 sf room was sufficient for many of the smaller buildings constructed. However, for larger complexes, having more building area to express on the various system control panels, larger Fire Command Centers may be necessary.

This proposal attempts to size the Fire Command Center in relation to the building size. The proposal returns to the original size of 96 sf as the base, but also can require much larger rooms, depending on the building served. The formula contained in this proposal returns the same Fire Command Center size for a building of 1,333,333 sf; smaller buildings will have smaller size requirements, while larger buildings will have larger size requirements. This table shows a sample of the varying sizes of the Fire Command Centers that would result from this proposal:

<table>
<thead>
<tr>
<th>Size of Building (SF)</th>
<th>Size of Fire Command Center (SF)</th>
<th>Minimum Dimension of Fire Command Center (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>250,000</td>
<td>37.5 (would be 96 due to minimum)</td>
<td>4.3 (would be 8 due to minimum)</td>
</tr>
<tr>
<td>500,000</td>
<td>75 (would be 96 due to minimum)</td>
<td>6.06 (would be 8 due to minimum)</td>
</tr>
<tr>
<td>640,000</td>
<td>96</td>
<td>6.9 (would be 8 due to minimum)</td>
</tr>
<tr>
<td>750,000</td>
<td>112.5</td>
<td>7.4 (would be 8 due to minimum)</td>
</tr>
<tr>
<td>1,000,000</td>
<td>150</td>
<td>8.6</td>
</tr>
<tr>
<td>1,333,333</td>
<td>200</td>
<td>9.9</td>
</tr>
<tr>
<td>2,000,000</td>
<td>300</td>
<td>12.1</td>
</tr>
<tr>
<td>5,000,000</td>
<td>750</td>
<td>19.2</td>
</tr>
<tr>
<td>10,000,000</td>
<td>1,500</td>
<td>27.1</td>
</tr>
</tbody>
</table>

Cost Impact: Will increase the cost of construction

This amendment will have varying effects on construction (both increase and decrease), as some buildings (those less than 1,333,333 sf in building area) would be able to use smaller Fire Command Centers than are currently required, while other buildings (those larger than 1,333,333 sf in building area) would be required to have larger Fire Command Centers than are

2016 ICC PUBLIC COMMENT AGENDA Page 1231
Committee Action: Disapproved

Committee Reason: There were a couple areas of concern with this proposal. The first was that the minimum size of 96 square feet was felt to be small. A minimum of 200 square feet was felt to be more appropriate. Also, there was no maximum area provided within the proposal and this could be quite large in larger buildings.

Assembly Action: None

Public Hearing Results

Public Comment 1:

Proponent: Stephen DiGiovanni, representing Southern Nevada Chapter of ICC (sdigiovanni@clarkcountynv.gov) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

508.1.3 (IBC F 911.1.3) Size. The fire command center shall be not less than 0.015 percent of the total building area of the facility served or 96, 200 square feet (8.9, 19 m²) in area, whichever is greater, with a minimum dimension of 0.7 times the square root of the room area, or 8, 10 feet (2438, 3048 mm), whichever is greater.

Commenter’s Reason: This proposal is revised to keep the same minimum fire command room size as currently exists in the code. The submittal continues to propose the use of a formula to require larger fire command center rooms for larger buildings.

F44-16
Proposed Change as Submitted

Proponent: Alan Perdue, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2015 International Fire Code

Revise as follows:

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

Exceptions:
1. Where approved by the building official and the fire code official, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained instead of an approved radio coverage system.
2. Where it is determined by the fire code official that the radio coverage system is not needed.
3. In facilities where emergency responder radio coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the fire code official shall have the authority to accept an automatically activated emergency responder radio coverage system.

Reason: There are instances whereby public safety communications systems are utilized by a jurisdiction but are not of (owned) by the jurisdiction such as but not limited to regional radio systems, FirstNet Nationwide Network, etc. This change is more specific and clarifies the intent of the section to include all public safety communications systems utilized by the emergency responders within the jurisdiction.

Cost Impact: Will not increase the cost of construction

This change provides clarification to existing intent.

Public Hearing Results

Committee Action: Approved as Submitted

Committee Reason: The proposal was approved based upon the proponents reason statement.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Jeffrey Shapiro, International Code Consultants, representing Self (jeff.shapiro@intlcodeconsultants.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

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

Exceptions:
1. Where approved by the building official and the fire code official, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained instead of an approved radio coverage system.
2. Where it is determined by the fire code official that the radio coverage system is not needed.
3. In facilities where emergency responder radio coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the fire code official shall have the authority to accept an automatically activated emergency responder radio coverage system.
Commenter's Reason: Editorial clarification of the text. No intended technical change.
Proposed Change as Submitted

Proponent: Alan Perdue, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2015 International Fire Code
Revise as follows:

510.4.1 Radio and data signal strength. The building shall be considered to have acceptable emergency responder radio and data coverage when signal strength measurements in 95 percent of all areas on each floor of the building meet the signal strength requirements in Sections 510.4.1.1, 510.4.1.2 and 510.4.1.3.

Add new text as follows:

510.4.1.3 Data Network Performance A data signal sufficient to meet the requirements of the applications being utilized by public safety for emergency operations shall be provided throughout the coverage area as specified by the fire code official in Section 510.4.2.2.

Reason: Voice and data (ex: LTE) network performance have different quality measures and thus data network performance needs to be addressed in a separate code section. Data network requirements evolve very quickly and thus allowing the fire code official to provide system parameters is warranted. This information, if required would be included in the technical criteria specified in advance by the fire code official in Section 510.4.2.2.

Cost Impact: Will not increase the cost of construction
This proposed new section is not requiring additional signals but simply provides for a method to determine the quality of the signal strength.

Public Hearing Results

Committee Action: Disapproved
Committee Reason: Addressing data coverage goes too far beyond the original scope of the overall section on fire fighter radios and was disapproved. It was suggested that the concept be looked at in more detail as it affects the entire section addressing fire fighter radios.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Alan Perdue, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org) requests Approve as Modified by this Public Comment.

Modify as follows:

2015 International Fire Code

510.4.1.3 Data Network Emergency Responder Communications Enhancement System Performance A data signal strength shall be sufficient to meet the requirements of the applications being utilized by public safety for emergency operations throughout the coverage area as specified by the fire code official in Section 510.4.2.2.

Commenter's Reason: Public safety agencies utilize a variety of systems (i.e. land mobile radio, FirstNet, etc.) to provide reliable and adequate communications in buildings within their response areas. These systems often have differing quality measures to ensure they are properly designed and maintained in working order. As the technology changes so does the ability to identify the best design parameters which should be determined by the fire code official or their communications provider agency. The information, if required would be included in the technical criteria specified in advance by the fire code official in Section 510.4.2.2.

Public Comment 2:

Proponent: Alan Perdue, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org) requests Approve as Modified by this Public Comment.
Modify as Follows:

2015 International Fire Code

510.4.1 Radio and data Emergency responder communications enhancement system signal strength. The building shall be considered to have acceptable emergency responder radio and data communications enhancement system coverage when signal strength measurements in 95 percent of all areas on each floor of the building meet the signal strength requirements in Sections 510.4.1.1, 510.4.1.2 and 510.4.1.3.

Commenter's Reason: Public Safety agencies utilize a variety of systems (i.e. land mobile radio, FirstNet, etc.) to provide reliable and adequate communications in buildings within their response areas. This proposal will clarify that whatever type of system(s) are used by the public safety agency the coverage shall be in 95% of all areas on each floor and designed in accordance with 510.4.1.1, 510.4.1.2 and 510.4.1.3.
Committee Action: Approved as Modified

Proponent: Alan Perdue, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2015 International Fire Code

Revise as follows:

510.4.1.1 Minimum signal strength into the building. A
The minimum inbound signal strength of -95 dBm shall be sufficient to provide usable voice communications throughout the coverage area, as specified by the fire code official. The inbound signal level shall be receivable within sufficient to provide a minimum of Delivered Audio Quality (DAQ) 3.0 or an equivalent Signal-to-Noise-Plus-Interference Ratio (SINR) applicable to the building technology for either analog or digital signals.

510.4.1.2 Minimum signal strength out of the building. A
The minimum outbound signal strength of -95 dBm shall be sufficient to provide usable voice communications throughout the coverage area, as specified by the fire code official. The outbound signal level shall be received by sufficient to provide a minimum of DAQ 3.0 or an equivalent SINR applicable to the agency's radio system when transmitted from within the building technology for either analog or digital signals.

Reason: This change aligns national standards with industry practices in delivering communications quality to the users of emergency responder systems. Utilizing a quality measure in dBm only addresses signal strength, not interference of noise, and thus is an incomplete assessment of usable signal. DAQ (Delivered Audio Quality) refers to a range of usable voice parameters and is useful regardless of the modulation or system technology utilized. This would allow a measure of how the signal will sound to the end user which is critical to emergency operations. A new section is being proposed to address data network performance for other emergency responder signals such as LTE which is part of the nationwide public safety responder network commonly known as FirstNet.

Cost Impact: Will not increase the cost of construction
This change does not impact the requirement of an emergency responder radio enhancement system but simply provides a better quality measurement of the signal being provided for use during emergency incidents.

Committee Reason: This proposal appropriately addresses a need to have not simply a strong signal but a quality signal. Simply depending upon strength was not seen as adequate. A modification was made to remove the comma after “coverage area” in both Sections 510.4.1.1 and 510.4.1.2. The reasoning being that it was unclear if the phrase “as specified by the fire code official” applied only to “coverage area” or to the overal criteria for the signal strength. The intent was to simply address “coverage area” so the comma was deleted.

Assembly Action: None

Analysis: Note the modification is very minor and may be difficult to find. It simply deletes a comma in the first sentence of section.
Individual Consideration Agenda

Proponent: Steven Orlowski, representing Building Owners and Managers Association International (sorlowski@boma.org) requests Disapprove.

Commenter’s Reason: After reviewing the changes approved with the passage of this proposal, BOMA is concerned with the change to go with the radio coverage testing to a DAQ 3.0, which is a subjective test metric which cannot be consistently applied or measurable. Enforcement of this provision will vary based on the hearing capability of the individuals performing the test and may vary widely based on the equipment capabilities with the local fire service. In addition, there is concern that this may negatively affect the communication capability for both new and existing buildings where additional interference can occur outside the control of the building owner which affect the DAQ level, where as the 95db level is more consistent and accurately measured.
Committee Action: Disapproved

Assembly Action: None

Proponent: Alan Perdue, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2015 International Fire Code

Revise as follows:

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

Add new text as follows:

510.6.3 Non-public safety system. Other non-public safety amplification system(s) installed within the building that reduce the performance or cause interference with the emergency responder radio coverage system shall be corrected immediately

Reason: With the public's reliance on cellular devices as a primary method of communications, many buildings are being equipped with cellular enhancement systems that provide improved coverage. If not properly designed, installed and maintained these non-public safety systems may cause interference and performance issues on the public safety radio enhancement system. This proposal provides the necessary tool for the fire code official to address interference of a required public safety system. Requiring immediate correction of the non-public safety system when it is causing interference or performance issues is vital to the public safety responders in the event of an incident.

Cost Impact: Will not increase the cost of construction

This proposal will not increase the cost of construction. It simply provides an avenue for the fire code official to address interference on the required public safety system.

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Public Hearing Results

Committee Reason: The proposal was disapproved with general concern with how this section will be enforced. In addition, there was concern with determining what “immediately” means. It often takes some time to determine what is causing the interference therefore it is not possible to address the problem “immediately.”

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Alan Perdue, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org) requests Approve as Modified by this Public Comment.

Modify as follows:

510.6.3 Non-public safety system. Other non-public safety amplification system(s) systems installed within the building that reduce the performance or cause interference with the emergency responder radio communications coverage system, the non-public safety amplification system shall be corrected immediately or removed

Commenter's Reason: With the public's reliance on cellular devices as a primary method of communications, many buildings are being equipped with cellular enhancement system that provide improved coverage. If not properly designed, installed and maintained these non-public safety systems may cause interference and performance issues on the public safety radio enhancement system. This proposal provides the necessary tool for the fire code official to address interference of a required public safety system when it is causing interference or performance issues is vital to the public safety responders in the event of an incident. Requiring correction or removal of the non-public safety system when it is causing interference or performance issues is vital to the public safety responders in the event of an incident.
Proposed Change as Submitted

Proponent: Thad Carlson, TrickleStar, representing TrickleStar LLC (Thad.Carlson@TrickleStar.com)

2015 International Fire Code
Add new definition as follows:

SECTION 202 DEFINITIONS

CURRENT TAP. A male and female contact device that, when connected to a permanently installed receptacle outlet, provides multiple receptacle outlet configurations. Current Taps are within the scope of UL 498A. Such devices can incorporate other features such as surge protection and over-current protection.

SECTION 202 DEFINITIONS

RELOCATABLE POWER TAP. A relocatable electrical enclosure that provides one or more receptacle outlets and that is provided with an attached power supply cord and attachment plug for connection to a permanently installed receptacle outlet. Relocatable power taps are within the scope of UL 1363 or UL 1363A. Such devices can incorporate other features such as surge protection and over-current protection.

Add new text as follows:

602.1 Definitions. The following terms are defined in Chapter 2:

BATTERY SYSTEM, STATIONARY LEAD-ACID.
BATTERY TYPES.
COMMERCIAL COOKING APPLIANCES.
CRITICAL CIRCUIT.
EMERGENCY POWER SYSTEM.
HOOD.
Type I.
Type II.
REFRIGERANT.
REFRIGERATION SYSTEM.
STANDBY POWER SYSTEM.
CURRENT TAP.
RELOCATABLE POWER TAP.

Revise as follows:

605.4 Multiplug adapters Current taps and relocatable power taps. Multiplug adapters

The construction, such as cube adapters design, unfused plug strips or any other device not complying use and application of current taps and relocatable power taps shall be in accordance with NFPA 70 shall be prohibited and Sections 605.4.1 through 605.4.3.

605.4.1 Power Current tap and relocatable power tap design. Relocatable power taps shall be of the polarized or grounded type, shall be equipped with overcurrent protection, and shall be listed and labeled in accordance with UL 1363 or UL 1363A. Current taps shall be of the polarized or grounded type and shall be listed and labeled in accordance with UL 498A. Devices incorporating surge protection features shall be listed and labeled in accordance with UL 1449.

605.4.2 Power supply Application and use. Relocatable

Current taps and relocatable power taps shall be directly connected to a permanently installed receptacle outlet. Current taps and relocatable power taps shall not be connected in series. Current taps and relocatable power taps shall not be powered by extension cord sets.

Exception: Current taps and relocatable power taps shall not be required to connect directly to a permanently installed receptacle outlet where used for 90 days or less for the purpose of testing the performance of such devices.

605.5.1 Power supply. Extension cords shall be plugged directly into an approved receptacle, power current tap or multiplug adapter.
relocatable power tap and, except for approved multiplug extension cords, shall serve only one portable appliance.

Reference standards type: This reference standard is new to the ICC Code Books
Add new standard(s) as follows:

UL 1363A Special purpose relocatable power taps
UL 498A - 2013 Current taps and adapters
UI 1449 Surge protective devices

Reason:
This IFC change proposal intends to update and harmonize the content of section 605.4 with language from supporting standards from NFPA and UL.

The first element of this change request is to add two new definitions to section 202 General Definitions. Specifically, we seek to add two new terms and supporting definitions for "Current Taps" and "Relocatable Power Taps." Legacy language in the IFC referenced "multplug adapters" in section 605.4; however, this term is non-standard in the electrical/construction industry and fails to harmonize with supporting standards from UL. As defined by UL, current taps and relocatable power taps are the devices section 605.4 in the IFC intends to cover. Therefore, we propose definitions for these terms which harmonize with the language UL uses to define these terms in the standards that govern them. Please note that we do not list requirements in the definitions.

The second element of this change request is to add two new terms in section 602.1 Definitions. The two terms we propose to add to this section are "current tap" and "relocatable power tap." Section 602.1 lists terms that appear in Chapter 6 which are defined in Chapter 2 in section 202.

The third element of this change request is to change the title and content of 605.4. As previously mentioned, the term "multplug adapter" is not a standard term. Therefore, we propose to change the title of this section to, "Current taps and relocatable power taps." We then propose to also retire the term "cube adapters," as this type of product no longer exists in the market. We next seek to optimize the language in 605.4 by way of adding clarity. The new language we propose for 605.4 is simply, "The construction, design, use and application of current taps and relocatable power taps shall be in accordance with NFPA 70 and Sections 605.4.1 through 605.4.3."

The fourth element of this change request is to change the title and content of 605.4.1. Currently "power tap design," we propose to change the title to "Current tap and relocatable power tap design." This title change supports the direction of this proposal initiated in 202 and 605.4. Establishing a connection to the UL safety standard that govern current taps and relocatable power taps is important, as is establishing a connection to the UL safety standard for surge protective devices. The new language proposed is as follows: "Relocatable power taps shall be of the polarized or grounded type, shall be equipped with overcurrent protection, and shall be listed and labeled in accordance with UL 1363. Current taps shall be of the polarized or grounded type and shall be listed and labeled in accordance with UL 498A. Devices incorporating surge protection features shall be listed and labeled in accordance with UL 1449." This language stays with the original intention of the IFC and adds relevance to current product and clarity of supporting safety standards.

The fifth element of this change request is to change the title and content of 605.4.2. Currently "Power supply," we propose to change the title to "Application and use." This title harmonizes with language from supporting UL safety standards. From there, we propose to identify both current taps and relocatable power taps as the devices covered under this section - specifically requirements to be directly connected to a receptacle outlet and to prohibit series connection of such devices. Finally, we propose to add an exception to this exception which allows temporary, non-standard connection for the purpose of testing and verifying performance of these devices. This exception has precedence with NFPA 70 article 590 "temporary installations."

There is a need in the market for this exception from both manufacturers that need to test their products and other stakeholders interested in verifying the performance of these products. This verification is typically plugging the current tap or relocatable power tap into an energy monitoring and logging device, such as the Hobo data logger by Onset. These devices are pass-through devices that do not add receptacle outlets to the circuit.

The last element of this change request is to update the content of 605.5.1 to eliminate reference to multiplug adapter and replace with a reference to current taps and relocatable power taps. The proposed language is as follows: "Extension cords shall be plugged directly into an approved receptacle, current tap or relocatable power tap and, except for approved multi-plug extension cords, shall serve only one portable appliance."
Cost Impact: Will not increase the cost of construction

Changes proposed will not increase cost of construction. Specifically, we are replacing legacy terms with updated terms for the products governed by this section. We are adding references to already-existing safety standards, which have existing conformity and enforcement systems. Finally, we propose an exception for testing and performance verification that is already common place in the market today.

Committee Action: Disapproved
Assembly Action: None

Public Hearing Results
Committee Reason: This proposal was disapproved due to conflicting standards. In addition, the proposal is placing details from the standards within the code language which is not necessary and inappropriate.

Individual Consideration Agenda
Public Comment 1:
Proponent: Thad Carlson, representing TrickleStar LLC (Thad.Carlson@TrickleStar.com) requests Approve as Modified by this Public Comment.

Modify as Follows:
2015 International Fire Code

SECTION 202 DEFINITIONS

CURRENT TAP. A male and female contact device that, where connected to a permanently installed receptacle outlet, provides multiple receptacle outlet configurations. Current Taps are within the scope of UL 498A. Such devices can incorporate other features such as surge protection and over-current protection.

SECTION 202 DEFINITIONS

RELOCATABLE POWER TAP. A relocatable electrical enclosure that provides one or more receptacle outlets and that is provided with an attached power supply cord and attachment plug for connection to a permanently installed receptacle outlet. Relocatable power taps are within the scope of UL 1363 or UL 1363A. Such devices can incorporate other features such as surge protection and over-current protection.

605.4.1 Current tap and relocatable power tap design.
Relocatable power taps shall be of the polarized or grounded type, shall be equipped with overcurrent protection, and shall be listed and labeled in accordance with UL 1363 or UL 1363A Current taps shall be of the polarized or grounded type and shall be listed and labeled in accordance with UL 498A. Devices incorporating surge protection features shall be listed and labeled in accordance with UL 1449.

605.4.2 Application and use.
Current taps and relocatable power taps shall be directly connected to a permanently installed receptacle outlet. Current taps and relocatable power taps shall not be connected in series. Current taps and relocatable power taps shall not be powered by extension cord sets.

Exception: Current taps and relocatable power taps shall not be required to connect directly to a permanently installed receptacle outlet where used for 90 days or less for the purpose of testing the performance of such devices.

Reference standards type: This is an update to reference standard(s) already in the ICC Code Books
Modify standard(s) as follows:

Commenter's Reason: We respect the committee's reason for disapproval, and with this public comment, we provide corrections to our original proposal F69-16 which satisfy the committee's concerns. We ask that the committee overturn the disapproval and advance this proposal to public comment consideration.

We ask that the committee advance F69-16 to public comment consideration for the following reasons:
F69-16 addresses real-world issues
F69-16 promotes harmonization with appropriate UL standards
F69-16 reduces conflict and improves efficiency with code official discussions

The reasoning provided by the committee was the following: "This proposal was disapproved due to conflicting standards. In addition, the proposal is placing details from the standards within the code language which is not necessary and inappropriate." Please update F69-16 with changes detailed in this public comment, which will satisfy committee concerns. Reasoning is as follows:

Section 202 Definitions
- Corrects previous outdated language and replaces with industry-standard terms which are also used in UL standards - harmonization of terms used across multiple standards

Section 602.1 Definitions
- Adds two new terms for products in the market today which were discussed in previous International Fire Code (IFC) editions using a different term - harmonization of terms used across multiple standards

Section 605.4 new title: Current taps and relocatable power taps
- Removes reference to products that no longer exist in the market
- Adds a reference to products that do exist in the market today using industry-standard names
- Makes an appropriate connection to NFPA 70 (National Fire Protection Association) which was absent in previous editions of the IFC

Section 605.4.1 new title: Current tap and relocatable power tap design
- Changes the approach of this section from NEGATIVE to POSITIVE
- Instead of saying "Products A, B, and C are prohibited," we propose the IFC identify which products are allowed.
- When focused on the negative, what if new products are introduced that should be prohibited? The code cannot deal with this as written today.
- When focused on the positive, all new products must meet the standard to be allowed - all others are prohibited.

Section 605.4.2 new title: Application and use
- Previous title of "Power Supply" was redundant with Section 605.5.1, which is also titled "Power Supply."
- Removes terms that no longer exist in the market; replaces with appropriate terms
- Adds emphasis and clarity to the requirement that devices must be directly connected to a permanently-installed receptacle outlet
- Adds a needed exception for testing the performance of devices in real-world environments
  - Language and approach is consistent with Article 590 of NFPA 70

Section 605.5.1 Power Supply
- Corrects outdated language with new industry-standard terms
Proposed Change as Submitted

Proponent: Jonathan Roberts (jonathan.roberts@ul.com)

2015 International Fire Code

Revised as follows:

603.4 Portable unvented heaters. Portable unvented fuel-fired heating equipment shall be prohibited in occupancies in Groups A, E, I, R-1, R-2, R-3 and R-4.

Exceptions:

1. Listed and approved unvented fuel-fired heaters, including portable outdoor gas-fired heating appliances, in one- and two-family dwellings.
2. Unvented fuel-fired heaters, listed in accordance with UL 647 and approved for use in one- and two-family dwellings.
3. Portable outdoor gas-fired heating appliances shall be allowed in accordance with Section 603.4.2.

Reference standards type: This reference standard is new to the ICC Code Books

Add new standard(s) as follows:

UL 647-93, Standard for Unvented Kerosene-Fired Room Heaters and portable Heaters - with revisions through April 2010.

Reason: UL 647, the UL Standard for Safety for Unvented Kerosene-Fired Room Heaters and Portable Heaters, provides requirements for unvented kerosene-fired room heaters, including requirements for automatic primary safety controls or to be inherently constructed to prevent abnormal discharge of fuel at the burner in case of ignition failure or premature flame extinguishment. This change adds the specific UL standard to be used for the certification and listing of Kerosene heaters. The exception for portable gas-fired heating appliances in Exception 1 for one- and two- family dwellings is already covered more completely by Exception 2.

Cost Impact: Will not increase the cost of construction
This simply clarifies the standard used to list these products.

Public Hearing Results

Committee Action: Approved as Modified

Modification:

603.4 Portable unvented heaters. Portable unvented fuel-fired heating equipment shall be prohibited in occupancies in Groups A, E, I, R-1, R-2, R-3 and R-4.

Exceptions:

1. Portable unvented fuel-fired heaters, listed in accordance with UL 647 and approved for use in one- and two-family dwellings.
2. Portable outdoor gas-fired heating appliances shall be allowed in accordance with Section 603.4.2.

Committee Reason: The addition of the reference to UL 647 was appropriate however there was some concern how this proposal was worded such that it would potentially allow such portable unvented heaters in other occupancies. The modification was simply to reflect the intent that the section deals only with “portable” unvented heaters.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Jonathan Roberts, representing Underwriters Laboratories (jonathan.roberts@ul.com) requests Approve as Modified by this Public Comment.

Further Modify as Follows:

2015 International Fire Code

603.4 Portable unvented heaters. Portable unvented fuel-fired heating equipment shall be prohibited in occupancies in
Groups A, E, I, R-1, R-2, R-3 and R-4.

Exceptions:

1. Portable unvented fuel-fired heaters, when approved and listed in accordance with UL 647 and approved shall be permitted for use in one- and two-family dwellings.

2. Portable outdoor gas-fired heating appliances shall be allowed in accordance with Section 603.4.2.

Commenter's Reason: In Proposal F72 AM, the way in which the exception is now worded it almost looks like where you have unvented heaters that meet UL647 that are approved for use in one and two family dwellings that they could be used in any of the prohibited occupancies above. It needs to be reworded to reflect that they are intended to be used for one and two family dwellings.

Proponent: Craig Conner, representing self (craig.conner@mac.com) requests Disapprove.

Commenter's Reason: The approved change makes the code worse by allowing these unvented heaters in almost any group. The standard referenced is overly expensive. The standard is not consensus.
--As the committee reason stated: "there was some concern how this proposal was worded such that it would potentially allow such portable unvented heaters in other occupancies". I agree. The change would allow kerosene "unvented fuel-fired heaters approved for one and two family dwellings" in almost any occupancy because the exception exempts unvented heaters from the section.
--I bought a copy of UL 647 to read it. It is absurdly expensive at $800. For about $30 more I could get a full set of the I-codes. We need a good reason to put such expensive standards into the I-codes.
--Per the ICC staff note, the standard does not claim to be consensus.
--It is also worth noting that Group A of the development process overwhelmingly rejected a somewhat similar proposal to put UL 1370, a standard for unvented alcohol burning devices, into the code.
Proposed Change as Submitted

Proponent: John Williams, CBO, representing Adhoc Healthcare Committee (AHC@iccsafe.org)

2015 International Fire Code
Revise as follows:

603.4 Portable unvented heaters. Portable unvented fuel-fired heating equipment shall be prohibited in occupancies in Groups A, E, I, R-1, R-2, R-3, R-4 and R-4 ambulatory care facilities.

Exceptions:
1. Listed and approved unvented fuel-fired heaters, including portable outdoor gas-fired heating appliances, in one- and two-family dwellings.
2. Portable outdoor gas-fired heating appliances shall be allowed in accordance with Section 603.4.2.

605.10 Portable, electric space heaters. Where not prohibited by other sections of this code, portable electric space heaters shall be permitted to be used in all occupancies other than Group I-2 and in accordance with Sections 605.10.1 through 605.10.5.

• Exception: The use of portable, electric space heaters in which the heating element cannot exceed a temperature of 212°F (100°C) shall be permitted in nonsleeping staff and employee areas in Group I-2 occupancies.

Add new text as follows:

605.10.1 Group I-2 occupancies and ambulatory care facilities. In Group I-2 and ambulatory care facilities, the use of portable, electric space heaters in which the heating element cannot exceed a temperature of 212°F (100°C) shall be permitted in nonsleeping staff and employee areas.

Reason: In the last code cycle, the requirements for the limitations for electric space heaters was provided for and passed for Group I-2 facilities and provided for consistency in the requirements for hospitals with other federal regulatory requirements.

The requirement for Ambulatory Healthcare Facilities has the same requirements; however, it was not addressed during the last code cycle due to time and limitations on the Adhoc Healthcare Committee. We are proposing this reorganization to IFC Section 605.10 to provide additional clarification for the specific requirements for Ambulatory Healthcare Facilities.

This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2014 and 2015 the ICC Ad Hoc Committee has held 4 open meetings and numerous Work Group meetings and conference calls for the current code development cycle which included members of the committees as well as any interested party to discuss and debate the proposed changes. Information on the AHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the AHC effort can be downloaded from the AHC website at: AHC (http://www.iccsafe.org/cs/AHC/Pages/default.aspx).

Cost Impact: Will not increase the cost of construction.
Practically this has been a long standing federal rule that is already being enforced at the state and federal level. Medicare certified facilities are used to this requirement. We expect that the use of fireplaces and portable space heater in non-medicare accredited ambulatory care is very minimal.

Public Hearing Results

Committee Action: Approved as Submitted

Committee Reason: The proposal clarifies what is specifically permitted for portable electric space heaters in Group I-2 occupancies. It removes the confusing format that currently includes a prohibition followed by an exception. In addition it appropriately adds a prohibition for Ambulatory care facilities.

Assembly Action: None
Public Comment 1:

Proponent : Jeffrey Shapiro, International Code Consultants, representing Self (jeff.shapiro@intlcodeconsultants.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

605.10 Portable, electric space heaters. Portable electric space heaters shall be permitted to be used in all occupancies in accordance with Sections 605.10.1 through 605.10.5.

605.10.5 Group I-2 occupancies and ambulatory care facilities. Where not prohibited by other sections of this code, portable, electric space heaters shall be permitted to be used in all occupancies in accordance with Sections 605.10.1 through 605.10.5.

In Group I-2 and ambulatory care facilities, the use of portable, electric space heaters in which the heating element shall be limited to those having a temperature of 212°F (100°C), and such heaters shall only be permitted used in nonsleeping staff and employee areas.

Commenter's Reason: This comment reinstates the "Where not prohibited by other sections of this code" text that was incorrectly deleted from 2015 IFC Section 605.10.

Revisions to Section 605.10.1 move the text to the last subsection because the existing subsections .1 through .4 are general. It's more appropriate to have an occupancy specific section at the end of the list.

In addition, the text of 605.10.1 (now proposed as 605.10.5) has been edited for clarity. As it is currently worded, the section states that a certain type of heater is permitted in nonsleeping staff and employee areas, but the code never says that any other type of heater cannot be used in these areas. The fix is essentially an editorial correction of the text so that it accomplishes the proponent's intent.
Proposed Change as Submitted

Proponent: Marcelo Hirschler, representing GBH International (gbhint@aol.com)

2015 International Fire Code

Revise as follows:

604.1 General. Emergency power systems and standby power systems required by this code or the International Building Code shall comply with Sections 604.1.1 through 604.1.8. The installation of stationary generators not required by code shall comply with section 604.7.

Add new text as follows:

604.7 Installation of stationary generators not required by code: Stationary generators not required by code shall be installed in accordance with Sections 604.7.1 and 604.7.2.

604.7.1 NFPA 37. Stationary generators shall be installed in accordance with NFPA 37.

604.7.2 Separation distance outdoor installations. Outdoor installations of stationary generators shall be separated from structures in accordance with Section 604.7.2.1, 604.7.2.2 or 604.7.2.3

604.7.2.1 Default installation distance. Generators installed outdoors shall be located not less than 5 ft (1.5 m) from structures having combustible walls and not less than 5 ft (1.5 m) from openings in walls.

604.7.2.2 Fire resistance rating. If all walls of the structure that are closer than 5 ft (1.5 m) from the generator enclosure have a fire resistance rating of at least 1 hour, no minimum separation distance shall be required.

604.7.2.3 Full scale fire test. The separation distance is not required to be in accordance with Sections 604.7.2.1 or 604.7.2.2 where it is demonstrated through full scale testing that a lesser distance is acceptable. The full scale test shall involve the generator and a combustible wall, shall demonstrate that the complete consumption of the combustibles in the tested generator will not cause ignition of the nearby wall and shall be acceptable to the fire code official. The generator shall be at a distance that is not less than that used in the fire test. The combustible wall that the stationary generator is being separated from shall be of similar materials to those that were used in the full scale testing.

Reference standards type: This is an update to reference standard(s) already in the ICC Code Books

Add new standard(s) as follows:

NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines (2015) - Already referenced in IMC and IFGC.

Reason: The IFC lacks the information an authority having jurisdiction needs to either provide for the location of generators not required by code or to assess the validity of any reports provided by a generator manufacturer seeking to place engines close to combustible walls. The IMC and the IFGC contain references to NFPA 37 (section 915. of the IMC and section 616 of the IFGC) but the IFC does not. NFPA 37 requires that generators installed outdoors not be placed closer than 5 ft from combustible walls. It does not, however, provide good guidance on exceptions, which are essential because most generators placed outdoors tend to be located much closer than 5 ft from the walls. In particular, there are no criteria for how to demonstrate that an engine fire will not ignite a combustible wall or for how close to the wall the engine can be placed. The proposed language provides that information without being a detailed test protocol and without ruling out the use of alternative means and methods as a tool.

1. In view of the close proximity between buildings which could install engines or generators to ensure uninterrupted electrical supply, clear criteria for engine placement are essential to permit adequate enforcement. Neither the IFC nor the IRC contain enforceable criteria.

2. This proposal ensures that it does not specify details of the full scale fire test procedure to be used for determining acceptable separation distances. This is reflected in the proposed wording.

3. This proposal does not include wording that would require specific test protocols but simply proposes wording that ensures a minimal level of safety, after full scale fire tests have been conducted.

4. Research conducted by the proponent has demonstrated that, if a generator burns it can cause the ignition of nearby combustible walls. Whether ignition of combustible walls occurs will depend primarily on three factors: (a) the amount and fire performance of the combustible materials in the generator and the engineering design of the generator and its enclosure, (b) the materials contained in the combustible walls present and (c) the distance between the generator and the combustible walls.

5. Fire tests have demonstrated that fire tests with some generators can be more severe when the generator is not operating because the associated cooling fan in the generator can result in the extinguishment of the fire when the generator is operating...
but not when the generator is idle. This has been shown for at least two
generator designs. (a) Jason Huczek (Southwest Research Institute) ["Custom Fire Testing of Power Generators for NFPA 37
Compliance", at the NFPA 2010 Annual Meeting, Session T68, June 9, 2010] and (b) Marcelo Hirschler ["Testing of Residential
Communications, London, UK]. Both publications are attached: one deals with full scale tests (like the ones recommended in
this proposal) and one deals with small scale tests. The results demonstrate that it is important that full scale tests be
conducted.
6. There can be no assurance that every generator will be provided with an adequate fan. Therefore, full scale fire tests or
calculations should ideally be conducted with both the generator operating and the generator idle. However, that requirement is
not included here, to allow maximum flexibility for the fire test.
7. The full scale fire tests or calculations leading to the determination of the safe location distance need to be conducted in
such a way that there is complete consumption of the combustible materials in the generator to ensure that the full scale fire
tests actually address the fire hazard.
8. If the full scale fire tests or calculations do not result in complete consumption of the combustible materials in the generator
there can be no assurance that the results are fully representative of the actual fire hazard.
9. There are different types of combustible wall materials that are in common use and the full scale fire tests need to be
conducted using either the wall materials to be used in the actual installation or the combustible wall materials with the poorest
fire performance. Fire tests have demonstrated that polypropylene siding is a more combustible wall material than either wood
siding or vinyl (PVC) siding. Peak heat release rate data for polypropylene, wood and PVC
siding materials are shown below.
10. The distance between the generator and the combustible walls should provide be a reasonable margin of safety so that if
the tests are conducted at a distance of, for example 1 ft., the generator should not be permitted to be placed closer than 1.5 ft.
(i.e. a 50% margin of safety). Such added fire safety requirement is not included here.
11. This proposal does not discuss the composition of the generators because the key issue is ensuring that a fire that
destroys all combustible materials does not cause wall ignition, irrespective of the materials used to construct the generator.

Heat release rate of siding materials (calorimeter testing)
Vinyl (PVC): 187 kW/m²
Wood (Cedar): 309 kW/m²
Polypropylene: 546 kW/m²

Cost Impact: Will increase the cost of construction
Adding requirements for location of generators, as proposed here, will improve fire safety. No such requirements exist at
present.

Public Hearing Results
Committee Action: Disapproved
Committee Reason: The committee liked the concept but the language needs refinement. Specifically there were concerns
with the formatting and language associated with the separation distance requirements.
Assembly Action: None

Individual Consideration Agenda

Public Comment 1:
Proponent: Marcelo Hirschler, representing GBH International (gbhint@aol.com) requests Approve as Modified by
this Public Comment.
Further Modify as Follows:
2015 International Fire Code
604.1 General. Emergency power systems and standby power systems required by this code or the International Building
Code shall comply with Sections 604.1.1 through 604.1.8. The installation of other stationary generators not required by code
shall comply with section 604.7.
604.7 Installation of stationary generators other than those required by Section 604.1.1 Installation of stationary generators other than those required by Section 604.1.1 shall comply with NFPA 37 and Section 604.7.1

604.7.1 Separation Distance Generators installed outdoors shall be located not less than 5 ft (1.52 m) from structures having combustible materials and not less than 5 ft (1.52 m) from openings in walls except where in compliance with Section 604.7.1.1 or 604.7.1.2.

604.7.1.1 Fire resistance rating If all walls of the structure that are closer than 5 ft (1.52 m) from the generator enclosure have a fire resistance rating of at least 1 hour, in accordance with ASTM E119 or UL 263, no minimum separation distance shall be required.

604.7.1.2 Fire test Generators installed outdoors shall not be required to comply with the separation distance in Section 604.7.1 if it has been demonstrated through a full scale fire test that a lesser distance is acceptable. The fire test shall involve the generator and a combustible wall and shall demonstrate that the complete consumption of the combustibles in the tested generator will not cause ignition of the nearby wall and shall be acceptable to the fire code official. The generator shall be located at a distance that is not less than that used in the fire test. The combustible wall near the generator shall be of similar materials to those that were used in the fire test.

604.7 Installation of stationary generators not required by code Stationary generators not required by code shall be installed in accordance with Sections 604.7.1 and 604.7.2.

604.7.2 Separation distance outdoor installations Outdoor installations of stationary generators shall be separated from structures in accordance with Section 604.7.2.1, 604.7.2.2 or 604.7.2.3

604.7.2.1 Fire resistance rating If all walls of the structure that are closer than 5 ft (1.5 m) from the generator enclosure have a fire resistance rating of at least 1 hour, no minimum separation distance shall be required.

604.7.2.2 Full scale fire test The separation distance is not required to be in accordance with Sections 604.7.2.1 or 604.7.2.2 where it is demonstrated through full scale testing that a lesser distance is acceptable. The full scale test shall involve the generator and a combustible wall, shall demonstrate that the complete consumption of the combustibles in the tested generator will not cause ignition of the nearby wall and shall be acceptable to the fire code official. The generator shall be at a distance that is not less than that used in the fire test. The combustible wall that the stationary generator is being separated from shall be of similar materials to those that were used in the full scale testing.

Commenter's Reason: The concept was acceptable to the technical committee but they felt that a reorganization of the language was needed. This public comment does that by clarifying the requirements.

F74-16
Proposed Change as Submitted

Proponent: Michael O'Brian representing the Fire Code Action Committee (FCAC@icc.org)

2015 International Fire Code

Add new text as follows:

105.7.9 Gas detection systems. A construction permit is required for installation of or modification to gas detection systems. Maintenance performed in accordance with this code is not considered a modification and shall not require a permit.

Delete without substitution:

SECTION 202 DEFINITIONS

202 Continuous gas detection system. A gas detection system where the analytical instrument is maintained in continuous operation and sampling is performed without interruption. Analysis is allowed to be performed on a cyclical basis not to exceed 30 minutes.

Add new definition as follows:

GAS DETECTION SYSTEM. A system or portion of a combination system that utilizes one or more stationary sensors to detect the presence of a specified gas at a specified concentration and initiate one or more responses required by this code, such as notifying a responsible person, activating an alarm signal, or activating or deactivating equipment. A self-contained gas detection and alarm device is not classified as a gas detection system.

Delete without substitution:

202 Gas detection system, continuous. See “Continuous gas detection system.”

Add new definition as follows:

HPM. See “Hazardous Production Material.”

Add new text as follows:

604.2.6 (IBC [F] 2702.2.6) Gas detection systems. Emergency power shall be provided for gas detection systems where required by Sections 604.2.8 and 604.2.14. Standby power shall be provided for gas detection systems where required by Section 916.5.

Revise as follows:

606.8 Refrigerant detection. Machinery rooms shall contain be provided with a refrigerant detector with an audible and visual alarm. The detector, or a sampling tube that draws air to the detector, shall be located in an area where refrigerant from a leak will concentrate. The alarm shall be actuated at a value not greater than the corresponding TLV-TWA values shown in the International Mechanical Code for Where ammonia is used as the refrigerant classification. Detectors and alarms, refrigerant detection shall be placed in approved locations comply with IIAR 2. The detector For refrigerants other than ammonia, refrigerant detection shall transmit a signal to an approved location comply with Section 606.8.1.

Add new text as follows:

606.8.1 Refrigerants other than ammonia. A detector, or a sampling tube that draws air to a detector, shall be provided at an approved location where refrigerant from a leak is expected to accumulate. The system shall be designed to initiate audible and visible alarms inside of and outside each entrance to the refrigerating machinery room and transmit a signal to an approved location where the concentration of refrigerant detected exceeds the lesser of the following:

1. The corresponding TLV-TWA values shown in the International Mechanical Code for the refrigerant classification.
2. 25 percent of the lower flammable limit (LFL).

Detection of a refrigerant concentration exceeding 25 percent of the lower flammable limit (LFL) shall stop refrigerant equipment in the machinery room in accordance with Section 606.9.1.
Revise as follows:

901.5 Installation acceptance testing. Fire detection and alarm systems, emergency alarm systems, gas detection systems, fire-extinguishing systems, fire hydrant systems, fire standpipe systems, fire pump systems, private fire service mains and all other fire protection systems and appurtenances thereto shall be subject to acceptance tests as contained in the installation standards and as approved by the fire code official. The fire code official shall be notified before any required acceptance testing.

901.6 Inspection, testing and maintenance. Fire detection and alarm systems, emergency alarm systems, and gas detection systems, fire extinguishing systems, mechanical smoke exhaust systems, and smoke and heat vents shall be maintained in an operative condition at all times, and shall be replaced or repaired where defective. Nonrequired fire protection systems and equipment shall be inspected, tested and maintained or removed.

902.1 Definitions. The following terms are defined in Chapter 2:

- ALARM NOTIFICATION APPLIANCE.
- ALARM SIGNAL.
- ALARM VERIFICATION FEATURE.
- ANNUNCIATOR.
- AUDIBLE ALARM NOTIFICATION APPLIANCE.
- AUTOMATIC.
- AUTOMATIC FIRE-EXTINGUISHING SYSTEM.
- AUTOMATIC SMOKE DETECTION SYSTEM.
- AUTOMATIC SPRINKLER SYSTEM.
- AUTOMATIC WATER MIST SYSTEM.
- AVERAGE AMBIENT SOUND LEVEL.
- CARBON DIOXIDE EXTINGUISHING SYSTEM.
- CLEAN AGENT.
- COMMERCIAL MOTOR VEHICLE.
- CONSTANTLY ATTENDED LOCATION.
- DELUGE SYSTEM.
- DETECTOR, HEAT.
- DRY-CHEMICAL EXTINGUISHING AGENT.
- ELEVATOR GROUP.
- EMERGENCY ALARM SYSTEM.
- EMERGENCY VOICE/ALARM COMMUNICATIONS.
- FIRE ALARM BOX, MANUAL.
- FIRE ALARM CONTROL UNIT.
- FIRE ALARM SIGNAL.
- FIRE ALARM SYSTEM.
- FIRE AREA.
- FIRE DETECTOR, AUTOMATIC.
- FIRE PROTECTION SYSTEM.
- FIRE SAFETY FUNCTIONS.
- FIXED BASE OPERATOR (FBO).
- FOAM-EXTINGUISHING SYSTEM.
- GAS DETECTION SYSTEM.
- HALOGENATED EXTINGUISHING SYSTEM.
- IMPAIRMENT COORDINATOR.
- INITIATING DEVICE.
- MANUAL FIRE ALARM BOX.
- MULTIPLE-STATION ALARM DEVICE.
- MULTIPLE-STATION SMOKE ALARM.
- NOTIFICATION ZONE.
- NUISANCE ALARM.
- PRIVATE GARAGE.
- RECORD DRAWINGS.
- SINGLE-STATION SMOKE ALARM.
- SLEEPING UNIT.
- SMOKE ALARM.
- SMOKE DETECTOR.
STANDPIPE SYSTEM, CLASSES OF.
Class I system.
Class II system.
Class III system.
STANDPIPE, TYPES OF.
Automatic dry.
Automatic wet.
Manual dry.
Manual wet.
Semiautomatic dry.
SUPERVISING STATION.
SUPERVISORY SERVICE.
SUPERVISORY SIGNAL.
SUPERVISORY SIGNAL-INITIATING DEVICE.
TIRES, BULK STORAGE OF.
TRANSIENT AIRCRAFT.
TROUBLE SIGNAL.
VISIBLE ALARM NOTIFICATION APPLIANCE.
WET-CHEMICAL EXTINGUISHING AGENT.
WIRELESS PROTECTION SYSTEM.
ZONE.
ZONE, NOTIFICATION.

908.1 Group H occupancies. Emergency alarms for the detection and notification of an emergency condition in Group H occupancies shall be provided as required in Chapter 50.

908.2 Group H-5 occupancy. Emergency alarms for notification of an emergency condition in an HPM facility shall be provided as required in Section 2703.12. A continuous gas detection system shall be provided for HPM gases in accordance with Section 2703.13.

Delete without substitution:

908.3 Highly toxic and toxic materials. Where required by Section 6004.2.2.10, a gas detection system shall be provided for indoor storage and use of highly toxic and toxic compressed gases.

908.4 Ozone gas-generator rooms. A gas detection system shall be provided in ozone gas-generator rooms in accordance with Section 6005.3.2.

908.5 Repair garages. A flammable gas detection system shall be provided in repair garages for vehicles fueled by nonodORIZED gases in accordance with Section 2311.7.2.

908.6 Refrigeration systems. Refrigeration system machinery rooms shall be provided with a refrigerant detector in accordance with Section 606.8.

908.7 Carbon dioxide (CO₂) systems. Emergency alarm systems in accordance with Section 5307.5.2 shall be provided where required for compliance with Section 5307.5.

Add new text as follows:

SECTION 916 GAS DETECTION SYSTEMS

916.1 Gas detection systems. Gas detection systems required by this code shall comply with Sections 916.2 through 916.11.

916.2 Permits. Permits shall be required as set forth in Sections 105.7.9.

916.2.1 Construction documents. Documentation of the gas detection system design and equipment to be used that is adequate to demonstrate compliance with the requirements of this code shall be provided with the application for permit.

916.3 Equipment. Gas detection system equipment shall be designed for use with the gases being detected and shall be installed in accordance with manufacturers’ instructions.

916.4 Power connections. Gas detection systems shall be permanently connected to the building electrical power supply or shall be permitted to be cord connected to an unswitched receptacle using an approved restraining means that secures the plug to the receptacle.

916.5 Emergency and standby power. Where standby or emergency power is not required elsewhere by this code, standby or emergency power shall be provided or the gas detection system shall initiate a trouble signal at an approved...
916.6 Sensor locations. Where a specific location for sensors is not specified elsewhere by this code, sensors shall be installed in approved locations where leaking gases are expected to accumulate.

916.7 Gas sampling. Gas sampling shall be performed continuously. Sample analysis shall be processed immediately after sampling, except as follows:
1. For HPM gases, sample analysis shall be performed at intervals not exceeding 30 minutes.
2. For toxic gases, sample analysis shall be performed at intervals not exceeding 5 minutes in accordance with Section 6004.2.2.7.
3. Where a less frequent or delayed sampling interval is approved.

916.8 System activation. A gas detection alarm shall be initiated where any sensor detects a concentration of gas exceeding the following thresholds:
1. For flammable gases, a gas concentration exceeding 25 percent of the lower flammable limit (LFL).
2. For non-flammable gases, a gas concentration exceeding the threshold specified by the section of this code requiring a gas detection system.

Upon activation of a gas detection alarm, alarm signals or other required responses shall be as specified by the section of this code requiring a gas detection system. Audible and visible alarm signals associated with a gas detection alarm shall be distinctive from fire alarm and carbon monoxide alarm signals.

916.9 Signage. Signs shall be provided adjacent to gas detection system alarm signaling devices that advise occupants of the nature of the signals and actions to take in response to the signal.

916.10 Fire alarm system connections. Gas sensors and gas detection systems shall not be connected to fire alarm systems unless approved and connected in accordance with the fire alarm equipment manufacturer's instructions.

916.11 Maintenance, testing and sensor calibration. Inspection and testing of gas detection systems shall be conducted not less than annually. Sensor calibration shall be confirmed at the time of sensor installation and calibration shall be performed at the frequency specified by the sensor manufacturer.

Revise as follows:

2308.2.2 Listed equipment. Hoses, hose connections, dispensers, gas detection systems and electrical equipment used for CNG shall be listed. Vehicle-fueling connections shall be listed and labeled.

2309.2.2 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. Hydrogen motor-fueling connections shall be listed and labeled or approved for use with hydrogen.

2311.7.1.2 Operation. The mechanical ventilation system shall operate continuously.

Exceptions:
1. Mechanical ventilation systems that are interlocked with a gas detection system designed in accordance with Sections 2311.7.2 through 2311.7.2.2.
2. Mechanical ventilation systems in repair garages that are used only for repair of vehicles fueled by liquid fuels or odorized gases, such as CNG, where the ventilation system is electrically interlocked with the lighting circuit.

2311.7.2 Gas detection system. Repair garages used for repair of vehicles fueled by nonodorized gases, including, but not limited to, hydrogen and nonodorized LNG, shall be provided with a flammable gas detection system that complies with Section 916. The gas detection system shall be designed to detect leakage of nonodorized gaseous fuel. Where lubrication or chassis service pits are provided in garages used for repairing nonodorized LNG-fueled vehicles, gas sensors shall be provided in such pits.
2311.7.2.2 2311.7.2.1 Operation System activation. Activation of the gas detection system alarm shall result in all of the following:

1. Initiation of distinct audible and visual alarm signals in the repair garage.
2. Deactivation of all heating systems located in the repair garage.
3. Activation of the mechanical ventilation system, where the ventilation system is interlocked with gas detection.

Delete without substitution:

2311.7.2.1 System design. The flammable gas detection system shall be listed or approved and shall be calibrated to the types of fuels or gases used by vehicles to be repaired. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL). Gas detection shall be provided in lubrication or chassis service pits of repair garages used for repairing nonodorized LNG-fueled vehicles.

2311.7.2.1.1 Gas detection system components. Gas detection system control units shall be listed and labeled in accordance with UL 864 or UL 2017. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and vapors being detected.

Revise as follows:

2311.7.2.3 2311.7.2.2 Failure of the gas detection system. Failure of the gas detection system shall result in the deactivation of automatically deactivate the heating system, activation of activate the mechanical ventilation system where the system is interlocked with the gas detection system gas detection system, and cause a trouble signal to sound in an approved location.

2702.1 Definitions. The following terms are defined in Chapter 2:

- CONTINUOUS GAS DETECTION SYSTEM.
- EMERGENCY CONTROL STATION.
- FABRICATION AREA.
- GAS DETECTION SYSTEM.
- HAZARDOUS PRODUCTION MATERIAL (HPM).
- HPM.
- HPM ROOM.
- PASS-THROUGH.
- SEMICONDUCTOR FABRICATION FACILITY.
- SERVICE CORRIDOR.
- TOOL.
- WORKSTATION.

2703.1.3 Signals. The emergency control station shall receive signals from emergency equipment and alarm and detection systems. Such emergency equipment and alarm and detection systems shall include, but not be limited to, the following where such equipment or systems are required to be provided either in this chapter or elsewhere in this code:

1. Automatic sprinkler system alarm and monitoring systems.
3. Emergency alarm systems.
4. Continuous gas Gas detection systems.
5. Smoke detection systems.
6. Emergency power system.
7. Automatic detection and alarm systems for pyrophoric liquids and Class 3 water-reactive liquids required by Section 2705.2.3.4.
8. Exhaust ventilation flow alarm devices for pyrophoric liquids and Class 3 water-reactive liquids cabinet exhaust ventilation systems required by Section 2705.2.3.4.

2703.13 Continuous gas Gas detection systems. A continuous gas detection system complying with Section 916 shall be provided for HPM gases where the physiological warning threshold level of the gas is at a higher level than the accepted permissible exposure limit (PEL) for the gas and for flammable gases in accordance with Sections 2703.13.1 through 2703.13.2.2.

2703.13.1 Where required. A continuous gas detection system shall be provided in the areas identified in Sections 2703.13.1.1 through 2703.13.1.4.

2703.13.1.1 Fabrication areas. A continuous gas detection system shall be provided in fabrication areas where HPM gas is used in the fabrication area.
2703.13.1.2 HPM rooms. A continuous gas detection system shall be provided in HPM rooms where HPM gas is used in the room.

2703.13.1.3 Gas cabinets, exhausted enclosures and gas rooms. A continuous gas detection system shall be provided in gas cabinets and exhausted enclosures for HPM gas. A continuous gas detection system shall be provided in gas rooms where HPM gases are not located in gas cabinets or exhausted enclosures.

2703.13.1.4 Corridors. Where HPM gases are transported in piping placed within the space defined by the walls of a corridor and the floor or roof above the corridor, a continuous gas detection system shall be provided where piping is located and in the corridor.

Exception: A continuous gas detection system is not required for occasional transverse crossings of the corridors by supply piping that is enclosed in a ferrous pipe or tube for the width of the corridor.

2703.13.2 Gas detection system operation. The continuous gas detection system shall be capable of monitoring the room, area or equipment in which the HPM gas is located at or below all the following gas concentrations:

1. Immediately dangerous to life and health (IDLH) values where the monitoring point is within an exhausted enclosure, ventilated enclosure or gas cabinet.
2. Permissible exposure limit (PEL) levels where the monitoring point is in an area outside an exhausted enclosure, ventilated enclosure or gas cabinet.
3. For flammable gases, the monitoring detection threshold level shall be vapor concentrations in excess of 25 percent of the lower flammable limit (LFL) where the monitoring is within or outside an exhausted enclosure, ventilated enclosure or gas cabinet.
4. Except as noted in this section, monitoring for highly toxic and toxic gases shall also comply with Chapter 60.

5307.5 Required protection. Where carbon dioxide storage tanks, cylinders, piping and equipment are located indoors, rooms or areas containing carbon dioxide storage tanks, cylinders, piping and fittings and other areas where a leak of carbon dioxide can collect shall be provided with either ventilation in accordance with Section 5307.5.1 or an emergency alarm system in accordance with Section 5307.5.2.

5307.5.2 Emergency alarm Gas detection system. An emergency alarm complying with Section 916 shall be provided to monitor areas where carbon dioxide can accumulate. The system shall comply with all be designed to initiate a local audible and visible alarm in the room or area in which the sensor is installed when the level of the following:

1. Continuous gas detection shall be provided to monitor areas where carbon dioxide can accumulate.
2. The threshold for activation of an alarm shall not exceed 5,000 parts per million (9,000 mg/m\(^3\)).
3. Activation of the emergency alarm system shall initiate a local alarm within the room or area in which the system is installed.

carbon dioxide exceeds 5,000 parts per million (9,000 mg/m\(^3\)).

5808.5 Gas detection system. Hydrogen fuel gas rooms shall be provided with an approved flammable gas detection system in accordance with Sections 916 and Sections 5808.5.1 through 5808.5.4.

5808.5.1 Operation System activation. Activation of the gas detection system alarm shall result in both of the following:

1. Initiation of distinct audible and visual alarm signals both inside and outside of the hydrogen fuel gas room.
2. Activation of the mechanical exhaust ventilation system.

Delete without substitution:

5808.5.1 System design. The flammable gas detection system shall be listed for use with hydrogen and any other flammable gases used in the hydrogen fuel gas room. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL) for the gas or mixtures present at their anticipated temperature and pressure.

5808.5.2 Gas detection system components. Gas detection system control units shall be listed and labeled in accordance with UL 864 or UL 2017. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and vapors being detected.

Revise as follows:

5808.5.4 Failure of the gas detection system. Failure of the gas detection system shall result in activation of automatically activate the mechanical exhaust ventilation system, cessation of hydrogen generation, and the sounding of a trouble signal to sound at an approved location.
**6004.2.2.7 Treatment systems.** The exhaust ventilation from gas cabinets, exhausted enclosures and gas rooms, and local exhaust systems required in Sections 6004.2.2.4 and 6004.2.2.5 shall be directed to a treatment system. The treatment system shall be utilized to handle the accidental release of gas and to process exhaust ventilation. The treatment system shall be designed in accordance with Sections 6004.2.2.7.1 through 6004.2.2.7.5 and Section 510 of the *International Mechanical Code*.

**Exceptions:**

1. Highly toxic and toxic gases—storage. A treatment system is not required for cylinders, containers and tanks in storage where all of the following controls are provided:
   1.1. Valve outlets are equipped with gas-tight outlet plugs or caps.
   1.2. Handwheel-operated valves have handles secured to prevent movement.
   1.3. Approved containment vessels or containment systems are provided in accordance with Section 6004.2.2.3.

2. Toxic gases—use. Treatment systems are not required for toxic gases supplied by cylinders or portable tanks not exceeding 1,700 pounds (772 kg) water capacity where the following are provided:
   5.1. A listed or approved gas detection system with a sensing interval not exceeding 5 minutes.
   5.2. A listed or approved automatic-closing fail-safe valve located immediately adjacent to cylinder valves. The fail-safe valve shall close when gas is detected at the permissible exposure limit (PEL) by a gas detection system monitoring the exhaust system at the point of discharge from the gas cabinet, exhausted enclosure, ventilated enclosure or gas room. The gas detection system shall comply with Section 6004.2.2.10.

**6004.2.2.10 Gas detection system.** A gas detection system complying with Section 916 shall be provided to detect the presence of gas at or below the PEL or ceiling limit of the gas for which detection is provided. The system shall be capable of monitoring the discharge from the treatment system at or below one-half the IDLH limit and shall initiate a response in accordance with Sections 6004.2.2.10.1 through 6004.2.2.10.3 if the gas detection alarm is activated.

**Exception:** A gas detection system is not required for toxic gases when the physiological warning threshold level for the gas is at a level below the accepted PEL for the gas.

**Delete without substitution:**

**6004.2.2.10.1 Gas detection system components.** Gas detection system control units shall be listed and labeled in accordance with UL 684 or UL 2075, or approved. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and vapors being detected, or approved.

**Revise as follows:**

**6004.2.2.10.2 6004.2.2.10.1 Alarms.** The gas detection system shall initiate a local alarm and transmit a signal to a constantly attended control station when a short-term hazard condition is detected. The alarm shall be both auditory and visible and provide warning both inside and outside the area where gas is detected. The audible alarm shall be distinct from all other alarms.

**Exception:** Signal transmission to a constantly attended control station is not required where not more than one cylinder of highly toxic or toxic gas is stored.

**6004.2.2.10.3 6004.2.2.10.2 Shut off of gas supply.** The gas detection system shall automatically close the shutoff valve at the source on gas supply piping and tubing related to the system being monitored for whichever gas is detected.

**Exception:** Automatic shutdown is not required for reactors utilized for the production of highly toxic or toxic compressed gases where such reactors are:
   1. Operated at pressures less than 15 pounds per square inch gauge (psig) (103.4 kPa).
   2. Constantly attended.
   3. Provided with readily accessible emergency shutoff valves.

**6004.2.2.10.4 6004.2.2.10.3 Valve closure.** Automatic closure of shutoff valves shall be in accordance with the following:
   1. Where the gas-detection sampling point initiating the gas detection system alarm is within a gas cabinet or exhausted enclosure, the shutoff valve in the gas cabinet or exhausted enclosure for the specific gas detected shall automatically close.
2. Where the gas-detection sampling point initiating the gas detection system alarm is within a gas room and compressed gas containers are not in gas cabinets or exhausted enclosures, the shutoff valves on all gas lines for the specific gas detected shall automatically close.

3. Where the gas-detection sampling point initiating the gas detection system alarm is within a piping distribution manifold enclosure, the shutoff valve for the compressed container of specific gas detected supplying the manifold shall automatically close.

   Exception: Where the gas-detection sampling point initiating the gas detection system alarm is at a use location or within a gas valve enclosure of a branch line downstream of a piping distribution manifold, the shutoff valve in the gas valve enclosure for the branch line located in the piping distribution manifold enclosure shall automatically close.

6005.3.2 Ozone gas generator rooms. Ozone gas generator rooms shall be mechanically ventilated in accordance with the International Mechanical Code with not less than six air changes per hour. Ozone gas generator rooms shall be equipped with a continuous gas detection system complying with Section 916 that will shut off the generator and sound a local alarm when concentrations above the permissible exposure limit (PEL) occur.

   Ozone gas generator rooms shall not be normally occupied, and such rooms shall be kept free of combustible and hazardous material storage. Room access doors shall display an approved sign stating: OZONE GAS GENERATOR—HIGHLY TOXIC—OXIDIZER.

6005.5 Automatic shutdown. Ozone gas generators shall be designed to shut down automatically under the following conditions:

1. When the dissolved ozone concentration in the water being treated is above saturation when measured at the point where the water is exposed to the atmosphere.

2. When the process using generated ozone is shut down.

3. When the gas detection system detects ozone.

3. Failure of the ventilation system for the cabinet or ozone-generator room.


6204.1.11 Standby power. Standby power shall be provided in accordance with Section 604 for the following systems used to protect Class I and unclassified detonable organic peroxide:

1. Exhaust ventilation system.

2. Treatment system.

3. Gas detection system.

4. Smoke detection system.

5. Temperature control system.

6. Fire alarm system.

6. Emergency alarm system.

2015 International Building Code

CHAPTER 2 DEFINITIONS

Delete without substitution:

SECTION 202 DEFINITIONS

202. [F] CONTINUOUS GAS DETECTION SYSTEM. A gas detection system where the analytical instrument is maintained in continuous operation and sampling is performed without interruption. Analysis is allowed to be performed on a cyclical basis at intervals not to exceed 30 minutes.

Add new definition as follows:

[F] GAS DETECTION SYSTEM. A system or portion of a combination system that utilizes one or more stationary sensors to detect the presence of a specified gas at a specified concentration and initiate one or more responses required by this code, such as notifying a responsible person, activating an alarm signal, or activating or deactivating equipment. A self-contained gas detection and alarm device is not classified as a gas detection system.

Revise as follows:

[F] 406.8.5 Gas detection system. Repair garages used for the repair of vehicles fueled by nonodorized gases such as hydrogen and nonodorized LNG, shall be provided with a flammable gas detection system that complies with Section 916. The gas detection system shall be designed to detect leakage of nonodorized gaseous fuel. Where
lubrication or chassis service pits are provided in garages used for repairing nonodorized LNG-fueled vehicles, gas sensors shall be provided in such pits.

[F] 406.8.5.2 Operation System activation. Activation of the gas detection system shall result in all of the following:

1. Initiation of distinct audible and visual alarm signals in the repair garage.
2. Initiation of local audible and visible alarms in approved locations.
3. Deactivation of all heating systems located in the repair garage.
4. Activation of the mechanical ventilation system, where the ventilation system is interlocked with gas detection.

[F] 406.8.5.3 Failure of the gas detection system. Failure of the gas detection system shall result in the deactivation of automatically deactivate the heating system, activation of the mechanical ventilation system where the system is interlocked with the gas detection system, and cause a trouble signal to sound in at an approved location.

Delete without substitution:

[F] 406.8.5.1 System design. The flammable gas detection system shall be listed or approved and shall be calibrated to the types of fuels or gases used by vehicles to be repaired. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL). Gas detection shall be provided in lubrication or chassis service pits of repair garages used for repairing nonodorized LNG-fueled vehicles.

[F] 406.8.5.1.1 Gas detection system components. Gas detection system control units shall be listed and labeled in accordance with UL 864 or UL 2017. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and vapors being detected.

Revise as follows:

[F] 415.2 Definitions. The following terms are defined in Chapter 2:

- CONTINUOUS GAS DETECTION SYSTEM.
- DETACHED BUILDING.
- EMERGENCY CONTROL STATION.
- EXHAUSTED ENCLOSURE.
- FABRICATION AREA.
- FLAMMABLE VAPORS OR FUMES.
- GAS CABINET.
- GAS DETECTION SYSTEM.
- GASROOM.
- HAZARDOUS PRODUCTION MATERIAL (HPM).
- HPM.
- HPM FLAMMABLE LIQUID.
- HPM ROOM.
- IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH).
- LIQUID.
- LIQUID STORAGE ROOM.
- LIQUID USE, DISPENSING AND MIXING ROOM.
- LOWER FLAMMABLE LIMIT (LFL).
- NORMAL TEMPERATURE AND PRESSURE (NTP).
- PHYSIOLOGICAL WARNING THRESHOLD LEVEL.
- SERVICE CORRIDOR.
- SOLID.
- STORAGE, HAZARDOUS MATERIALS.
- USE (MATERIAL).
- WORKSTATION.

[F] 415.11.7 Continuous gas detection systems. A continuous gas detection system complying with Section 916 shall be provided for HPM gases where the physiological warning threshold level of the gas is at a higher level than the accepted permissible exposure limit (PEL) for the gas and for flammable gases in accordance with Sections 415.11.7.1 and through 415.11.7.2.

[F] 415.11.7.1 Where required. A continuous gas detection system shall be provided in the areas identified in Sections 415.11.7.1.1 through 415.11.7.1.4.
415.11.7.1 Fabrication areas. A continuous gas detection system shall be provided in fabrication areas where HPM gas is used in the fabrication area.

415.11.7.1.2 HPM rooms. A continuous gas detection system shall be provided in HPM rooms where HPM gas is used in the room.

415.11.7.1.3 Gas cabinets, exhausted enclosures and gas rooms. A continuous gas detection system shall be provided in gas cabinets and exhausted enclosures for HPM gas. A continuous gas detection system shall be provided in gas rooms where HPM gases are not located in gas cabinets or exhausted enclosures.

415.11.7.1.4 Corridors. Where HPM gases are transported in piping placed within the space defined by the walls of a corridor and the floor or roof above the corridor, a continuous gas detection system shall be provided where piping is located and in the corridor.

Exception: A continuous gas detection system is not required for occasional transverse crossings of the corridors by supply piping that is enclosed in a ferrous pipe or tube for the width of the corridor.

415.11.7.2 Gas detection system operation. The continuous gas detection system shall be capable of monitoring the room, area or equipment in which the HPM gas is located at or below all the following gas concentrations:

1. Immediately dangerous to life and health (IDLH) values where the monitoring point is within an exhausted enclosure, ventilated enclosure or gas cabinet.
2. Permissible exposure limit (PEL) levels where the monitoring point is in an area outside an exhausted enclosure, ventilated enclosure or gas cabinet.
3. For flammable gases, the monitoring detection threshold level shall be vapor concentrations in excess of 25 percent of the lower flammable limit (LFL) where the monitoring is within or outside an exhausted enclosure, ventilated enclosure or gas cabinet.
4. Except as noted in this section, monitoring for highly toxic and toxic gases shall also comply with Chapter 60 of the International Fire Code.

415.11.9.3 Signals. The emergency control station shall receive signals from emergency equipment and alarm and detection systems. Such emergency equipment and alarm and detection systems shall include, but not be limited to, the following where such equipment or systems are required to be provided either in this chapter or elsewhere in this code:

1. Automatic sprinkler system alarm and monitoring systems.
3. Emergency alarm systems.
4. Continuous gas detection systems.
5. Smoke detection systems.
6. Emergency power system.
7. Automatic detection and alarm systems for pyrophoric liquids and Class 3 water-reactive liquids required in Section 2705.2.3.4 of the International Fire Code.
8. Exhaust ventilation flow alarm devices for pyrophoric liquids and Class 3 water-reactive liquids cabinet exhaust ventilation systems required in Section 2705.2.3.4 of the International Fire Code.

421.6 Gas detection system. Hydrogen fuel gas rooms shall be provided with an approved flammable gas detection system in accordance with a gas detection system that complies with Sections 916, and Sections 421.6.1 through 421.6.2.

421.6.3 421.6.1 Operation System activation. Activation of the gas detection system alarm shall result in all both of the following:

1. Initiation of distinct audible and visual alarm signals both inside and outside of the hydrogen fuel gas room.
2. Activation of the mechanical exhaust ventilation system.

Delete without substitution:

421.6.1 System design. The flammable gas detection system shall be listed for use with hydrogen and any other flammable gases used in the hydrogen fuel gas room. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower flammability limit (LFL) for the gas or mixtures present at their anticipated temperature and pressure.

Revise as follows:

421.6.2 Failure of the gas detection system. Failure of the gas detection system shall result in activation of the mechanical exhaust ventilation system, cessation of hydrogen generation, and the sounding of a trouble signal at an approved location.

Delete without substitution:
Gas detection system components. Gas detection system control units shall be listed and labeled in accordance with UL 864 or UL 2017. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and vapors being detected.

Reason: Gas detection systems are required for many different applications in the code. There is great inconsistency in how these systems are treated, and some requirements cannot be enforced because required listed gas detectors, controls and systems are not commercially available. A working group of the Fire Code Action Committee that included industry and code officials worked on developing this proposal that addresses these concerns. The significant changes accomplished with this proposal are as follows:

- Section 105.7.9 - A construction permit is required for installation of gas detection systems.
- Section 202 – A definition of gas detection system was added that replaces the Continuous Gas Detection System definition. Continuous gas sampling is addressed further in Section 916.6.
- Section 604.2.6 - Gas detection systems are required to be provided with emergency or standby power. By default, Section 604 requires minimum 2 hours' duration. An option for providing a power loss trouble signal in an approved location in lieu of standby power is included in Section 916.5.
- Section 606.8 requires ammonia refrigerant systems to comply with the IIAR 2 standard, which is already referenced in Section 606.
- In Section 908 only items 1 and 2 apply to emergency alarm systems, items 3 through 7 really reference gas detection systems. The unnecessary/incorrect cross references were deleted.
- Section 916 includes basic requirements for all gas detection systems and covers construction documents, equipment, power connections, emergency and standby power, sensor locations, gas sampling, system activation, signage, fire alarm system connections, maintenance, testing and sensor calibration. These are important safety requirements that are applicable to all gas detection systems, including those installed in a small mom and pop operation up to those in large industrial facilities. Gas detection system equipment is commercially available that can comply with these requirements.
- Most of the revisions in Sections 23 through 64 accomplished the following: (1) deleted references to listed detectors and equipment, (2) provided consistency in how gas detection requirements are treated, (3) included cross references to Section 916 for basic system requirements, and (4) clarified existing requirements.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Cost Impact: Will increase the cost of construction
The additional construction requirements in this proposal have the potential to increase construction costs. However, since the features described in Section 916 are currently available with most gas detection equipment on the market today, the additional costs may not be significant.
Proponent: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Building Code

SECTIONS 202 DEFINITIONS

[F] GAS DETECTION SYSTEM A system or portion of a combination system that utilizes one or more stationary sensors to detect the presence of a specified gas at a specified concentration and initiate one or more responses required by this code, such as notifying a responsible person, activating an alarm signal, or activating or deactivating equipment. A self-contained gas detection and alarm device is not classified as a gas detection system.

[F] HPM. See "Hazardous Production Material."

[F] 415.5.3 Supervision. Emergency alarm systems required by Section 415.5.1 or 415.5.2 shall be electrically supervised and monitored by an approved central, proprietary or remote station service or shall initiate an audible and visual signal at a constantly attended on-site location.

[F] 415.5.4 Emergency alarm systems. Emergency alarm systems required by Section 415.5.1 or 415.5.2 shall be provided with emergency or standby power in accordance with Section 2702.2.8 and 2702.2.14.

[F] 908.1 Group H occupancies. Emergency alarms for the detection and notification of an emergency condition in Group H occupancies shall be provided in accordance with Section 415.5.

[F] 908.2 Group H-5 occupancy. Emergency alarms for notification of an emergency condition in an HPM facility shall be provided as required in Section 415.11.3.5. A continuous gas detection system shall be provided for HPM gases in accordance with Section 415.11.7.

[F] 908.3 Highly toxic and toxic materials. A gas detection system shall be provided to detect the presence of highly toxic or toxic gas at or below the permissible exposure limit (PEL) or ceiling limit of the gas for which detection is provided. The system shall be capable of monitoring the discharge from the treatment system at or below one-half the immediately dangerous to life and health (IDLH) limit.

- Exception: A gas detection system is not required for toxic gases when the physiological warning threshold level for the gas is at a level below the accepted PEL for the gas.

[F] 908.3.1 Alarms. The gas detection system shall initiate a local alarm and transmit a signal to a constantly attended control station when a short-term hazard condition is detected. The alarm shall be both visible and audible and shall provide warning both inside and outside the area where gas is detected. The audible alarm shall be distinct from all other alarms.

- Exception: Signal transmission to a constantly attended control station is not required when not more than one cylinder of highly toxic or toxic gas is stored.

[F] 908.3.2 Shutoff of gas supply. The gas detection system shall automatically close the shutoff valve at the source on gas supply piping and tubing related to the system being monitored for whichever gas is detected.

- Exception: Automatic shutdown is not required for reactors utilized for the production of highly toxic or toxic compressed gases where such reactors are:
  1. Operated at pressures less than 15 pounds per square inch gauge (psig) (103.4 kPa).
  2. Constantly attended.
  3. Provided with readily accessible emergency shutoff valves.

[F] 908.3.3 Valve closure. The automatic closure of shutoff valves shall be in accordance with the following:

1. When the gas detection sampling point initiating the gas detection system alarm is within a gas cabinet or exhausted enclosure, the shutoff valve in the gas cabinet or exhausted enclosure for the specific gas detected shall automatically close.
2. Where the gas detection sampling point initiating the gas detection system alarm is within a gas room and compressed gas containers are not in gas cabinets or exhausted enclosures, the shutoff valves on all gas lines for the specific gas detected shall automatically close.
3. Where the gas detection sampling point initiating the gas detection system alarm is within a piping distribution manifold enclosure, the shutoff valve for the compressed container of specific gas detected supplying the manifold shall automatically close.

- Exception: When the gas detection sampling point initiating the gas detection system alarm is at a use location or within...
a gas valve enclosure of a branch line downstream of a piping distribution manifold, the shutoff valve in the gas valve enclosure for the branch line located in the piping distribution manifold enclosure shall automatically close.

[F] 908.4 Ozone gas-generator rooms. Ozone gas-generator rooms shall be equipped with a continuous gas detection system that will shut off the generator and sound a local alarm when concentrations above the PEL occur.

[F] 908.5 Repair garages. A flammable-gas detection system shall be provided in repair garages for vehicles fueled by nonodorized gases in accordance with Section 406.9.5.

[F] 908.6 Refrigerant detector. Machinery rooms shall contain a refrigerant detector with an audible and visual alarm. The detector, or a sampling tube that draws air to the detector, shall be located in an area where refrigerant from a leak will concentrate. The alarm shall be actuated at a value not greater than the corresponding TLV-TWA values for the refrigerant classification shown in the International Mechanical Code for the refrigerant classification. Detectors and alarms shall be placed in approved locations. The detector shall transmit a signal to an approved location.

[F] 908.7 Carbon dioxide (CO₂) systems. Emergency alarm systems in accordance with Section 5307.5.2 of the International Fire Code shall be provided where required for compliance with Section 5307.5 of the International Fire Code.

CHAPTER PART  SECTION 916— GAS DETECTION SYSTEMS

[F] 916.1 General. Gas detection systems required by this code shall comply with Sections 916.2 through 916.11.

[F] 916.2 Construction documents. Documentation of the gas detection system design and equipment to be used that is adequate to demonstrate compliance with the requirements of this code shall be provided with the application for permit.

[F] 916.3 Equipment. Gas detection system equipment shall be designed for use with the gases being detected and shall be installed in accordance with manufacturers' instructions.

[F] 916.4 Power connections. Gas detection systems shall be permanently connected to the building electrical power supply or shall be permitted to be cord connected to an unswitched receptacle using an approved restraining means that secures the plug to the receptacle.

[F] 916.5 Emergency and standby power. Where standby or emergency power is not required elsewhere by this code, standby or emergency power shall be provided or the gas detection system shall initiate a trouble signal at an approved location if the power supply is interrupted.

[F] 916.6 Sensor locations. Where a specific location for sensors is not specified elsewhere by this code, sensors shall be installed in approved locations where leaking gases are expected to accumulate.

[F] 916.7 Gas sampling. Gas sampling shall be performed continuously. Sample analysis shall be processed immediately after sampling, except as follows:

1. For HPM gases, sample analysis shall be performed at intervals not exceeding 30 minutes.
2. For toxic gases that are not HPM, sample analysis shall be performed at intervals not exceeding 5 minutes in accordance with Section 6004.2.2.7 of the International Fire Code.
3. Where a less frequent or delayed sampling interval is approved.

[F] 916.8 System activation. A gas detection alarm shall be initiated where any sensor detects a concentration of gas exceeding the following thresholds:

1. For flammable gases, a gas concentration exceeding 25 percent of the lower flammable limit (LFL).
2. For non-flammable gases, a gas concentration exceeding the threshold specified by the section of this code requiring a gas detection system.

Upon activation of a gas detection alarm, alarm signals or other required responses shall be as specified by the section of this code or the International Fire Code requiring a gas detection system. Audible and visible alarm signals associated with a gas detection alarm shall be distinctive from fire alarm and carbon monoxide alarm signals.

[F] 916.9 Signage. Signs shall be provided adjacent to gas detection system alarm signaling devices that advise occupants of the nature of the signals and actions to take in response to the signal.

[F] 916.10 Fire alarm system connections. Gas sensors and gas detection systems shall not be connected to fire alarm systems unless approved and connected in accordance with the fire alarm equipment manufacturer's instructions.

[F] 916.11 Inspection, testing and sensor calibration. Gas detection systems and sensors shall be inspected, tested and calibrated in accordance with the International Fire Code.

[F] 2702.2.1 Emergency alarm systems. Emergency power shall be provided for emergency alarm systems as required by Section 415.5.

[F] 2702.2.6 Gas detection systems. Emergency or standby power shall be provided for gas detection systems in accordance with the International Fire Code.
604.2.2 Emergency alarm systems. Emergency power shall be provided for emergency alarm systems as required by Section 414 of the International Building Code.

606.8.1 Refrigerants other than ammonia. A detector, or a sampling tube that draws air to a detector, shall be provided at an approved location where refrigerant from a leak is expected to accumulate. The system shall be designed to initiate audible and visible alarms inside of and outside each entrance to the refrigerating machinery room and transmit a signal to an approved location where the concentration of refrigerant detected exceeds the lesser of the following:
   1. The corresponding TLV-TWA values shown in the International Mechanical Code for the refrigerant classification.
   2. 25 percent of the lower flammable limit (LFL).

Detection of a refrigerant concentration exceeding the detector’s upper detection limit or 25 percent of the lower flammable limit (LFL), whichever is lower, shall stop refrigerant equipment in the machinery room in accordance with Section 606.9.1.

916.7 Gas sampling. Gas sampling shall be performed continuously. Sample analysis shall be processed immediately after sampling, except as follows:
   1. For HPM gases, sample analysis shall be performed at intervals not exceeding 30 minutes.
   2. For toxic gases that are not HPM, sample analysis shall be performed at intervals not exceeding 5 minutes in accordance with Section 6004.2.2.7.
   3. Where a less frequent or delayed sampling interval is approved.

916.11 Maintenance inspection, testing and sensor calibration. No change to text.

2311.7.1.1 Design. For indoor locations, air supply inlets and exhaust outlets for mechanical ventilation shall be arranged to provide uniformly distributed air movement, with inlets uniformly arranged on exterior walls near floor level and outlets located at the high point of the room in exterior walls or the roof.

Failure of the ventilation system shall cause the fueling system to shut down. The exhaust ventilation rate shall be not less than 1 cubic foot per minute [0.03 m³/minute] per 12 cubic feet [0.34 m³] of room volume.

6004.2.2.7 Treatment systems. The exhaust ventilation from gas cabinets, exhausted enclosures and gas rooms, and local exhaust systems required in Sections 6004.2.2.4 and 6004.2.2.5 shall be directed to a treatment system. The treatment system shall be utilized to handle the accidental release of gas and to process exhaust ventilation. The treatment system shall be designed in accordance with Sections 6004.2.2.7.1 through 6004.2.2.7.5 and Section 510 of the International Mechanical Code.

Exceptions:
   1. Highly toxic and toxic gases—storage. A treatment system is not required for cylinders, containers and tanks in storage where all of the following controls are provided:
      1.1. Valve outlets are equipped with gas-tight outlet plugs or caps.
      1.2. Handwheel-operated valves have handles secured to prevent movement.
      1.3. Approved containment vessels or containment systems are provided in accordance with Section 6004.2.2.3.
      1.4. Toxic gases—use. Treatment systems are not required for toxic gases supplied by cylinders or portable tanks not exceeding 1,700 pounds (772 kg) water capacity where the following are provided:
         5.1. A listed or approved gas detection system with a sensing interval not exceeding 5 minutes.
         5.2. A listed or approved automatic-closing fail-safe valve located immediately adjacent to cylinder valves. The fail-safe valve shall close when gas is detected at the permissible exposure limit (PEL) by a gas detection system monitoring the exhaust system at the point of discharge from the gas cabinet, exhausted enclosure, ventilated enclosure or gas room. The gas detection system shall comply with Section 6004.2.2.10.
   2. Toxic gases—use. Treatment systems are not required for toxic gases supplied by cylinders or portable tanks not exceeding 1,700 pounds (772 kg) water capacity where a gas detection system complying with Section 6004.2.2.10 and listed or approved automatic-closing fail-safe valves are provided. The gas detection system shall have a sensing interval not exceeding 5 minutes. Automatic-closing fail-safe valves shall be located immediately adjacent to cylinder valves and shall close when gas is detected at the permissible exposure limit (PEL) by a gas sensor monitoring the exhaust system at the point of discharge from the gas cabinet, exhausted enclosure, ventilated enclosure or gas room.

6005.5 Automatic shutdown. Ozone gas generators shall be designed to shut down automatically under the following conditions:
   1. When the dissolved ozone concentration in the water being treated is above saturation when measured at the point where the water is exposed to the atmosphere.
   2. When the process using generated ozone is shut down.
3. Failure of the ventilation system for the cabinet or ozone-generator room.


2015 International Mechanical Code

[F] 502.16.1 Design. Indoor
For indoor locations shall be ventilated utilizing air supply inlets and exhaust outlets for mechanical ventilation shall be arranged to provide uniform uniformly distributed air movement to the extent practical. Inlets shall be uniformly arranged on exterior walls near floor level. Outlets shall be located at the high point of the room in exterior walls or the roof.

Ventilation shall be by a continuous mechanical ventilation system or by a mechanical ventilation system activated by a continuously monitoring natural gas detection system, or for hydrogen, a continuously monitoring flammable gas detection system, each activating at a gas concentration of 25 percent of the lower flammable limit (LFL). In all cases, the system shall shut down the fueling system in the event of failure of the ventilation system shall cause the fueling system to shut down.

The exhaust ventilation rate shall be not less than 1 cubic foot per minute \[0.03 \text{ m}^3/\text{minute}\] per 12 cubic feet \[0.00138 \text{ m}^3/\text{s} \cdot \text{m}^3\] of room volume.

Commenter's Reason: F75-16 was approved as submitted and included a complete rewrite of IFC gas detection system requirements. The proposal did not include some of the changes needed for correlation of corresponding IBC gas detection system requirements. This public comment makes those additional changes, all of which are denoted with [F] designations as being maintained by the IFC committee. With the exception of correcting a single item in IFC Section 6005.5 that was not copied when the original proposal was entered into cdpACCESS changes are for code correlation and clean-up with no intended technical changes to what was already approved in the original proposal and current IFC/IBC/IMC requirements, including:

1. Changes to Section 415.5.3, which relate to supervision and monitoring, improve correlation with source requirements in IFC Sections 5004.10 and 5005.1.6.

2. Changes to Section 415.5.4 add recognition of standby power to improve correlation with source requirements in IFC Sections 5004.7 and 5005.1.5, which allow standby power in lieu of emergency power in most cases.

3. IFC Section 604.2.2 and IBC Section 2702.2.1 are being deleted because “emergency alarm systems” relate exclusively to hazardous materials storage and use and to semi-conductor manufacturing occupancies. Requirements for these occupancies are already provided by IFC Sections 604.2.8 and 604.2.14 and IBC Sections 2702.2.8 and 2702.2.14.

4. IBC Section 2702.2.6 is being added to correlate with the new IFC Section 604.2.4, which was added by the original F75-16 proposal.

5. IFC Section 916.7 is being revised to clarify that HPM toxic gases are covered by Item 1, not Item 2.

6. IFC Section 606.8.1 is being revised to correlate with the referenced requirement in Section 606.9.1, which also addresses the detector’s upper detection limit.

7. Changes to IMC 502.16.1 are for correlation with IFC 2311.7.1.1. Also note that both sections were correlated with the revisions made in F274-16.

F75-16
Committee Action: Disapproved

Proposed Change as Submitted

Proponent: Vickie Lovell, InterCode Incorporated, representing 3M (vickie@intercodeinc.com)

2015 International Fire Code

Add new text as follows:

604.1.2 (IBC [F] 2702.1.2) Fuel line piping protection. Fuel lines supplying a generator set inside a building shall be separated from areas of the building other than the room the generator is located in by an approved method, or an assembly that has a fire-resistance rating of not less than 2 hours. Where the building is protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, the required fire-resistance rating shall be reduced to 1 hour.

Reason: This proposal is intended to require fuel lines supplying a generator set inside a building to be separated with fire-resistance-rated construction from areas of the building other than in the room in which the generator is located. It mirrors the text that was approved for the 2015 IBC in Section 403.4.8.2 for high-rises and was overwhelmingly supported by the ICC membership.

This proposal extends the requirement to any building that has a generator that is separated from the rest of the building. It is common for diesel-fueled generators to supply the generators with a day tank and resupply the day tank via remote fuel oil tanks. The fuel line piping from those remote tanks to the generator can be exposed to the same fire incident that the generator has been protected against. Loss of the fuel line due to fire exposure has the same impact as loss of the generator itself.

The wording only refers to “fuel lines” to also provide protection in those cases where a gaseous fuel supply is approved for use.

Cost Impact: Will increase the cost of construction

This requirement for protection of the fuel lines supplying stationary generators already applies to high-rise buildings. This proposal, if approved, would require labor to install generic materials or a proprietary system to protect fuels lines in all buildings with stationary generators

Public Hearing Results

Committee Action: Disapproved

Committee Reason: This proposal was seen as over restrictive and too far reaching. The concerns related to the fact that the requirements would include all occupancies, all types of construction and not necessarily relate to the ratings required for the type of construction. Also there was concern that this would include supply piping that is normally empty.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Amanda Hickman, InterCode Incorporated, representing 3M (amanda@intercodeinc.com) requests Approve as Modified by this Public Comment.

Replace Proposal as Follows:

2015 International Fire Code

604.1.2 Installation. Emergency power systems and standby power systems shall be installed in accordance with the International Building Code, NFPA 70, NFPA 110 and NFPA 111.

Piping that supplies the required fuel supply to a standby or emergency generator in a high-rise building shall be separated from areas of the building other than the room the generator is located in by one of the following methods:
1. A 2-hour rated fire-resistant pipe-protection system listed in accordance with UL 1489, or
2. An assembly that has a fire-resistant rating of not less than 2 hours.

   **Exception:** Where the building is protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, the required fire-resistance rating shall be reduced to 1 hour.

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**2015 International Building Code**

[F] 2702.1.2 Electrical. **Installation** Emergency power systems and standby power systems required by this code or the International Fire Code shall be installed in accordance with the International Fire Code, NFPA 70, NFPA 110 and NFPA 111.

Piping that supplies the required fuel supply to a standby or emergency generator in a high-rise building shall be separated from areas of the building other than the room the generator is located in by one of the following methods:

1. A 2-hour rated fire-resistant pipe-protection system listed in accordance with UL 1489, or
2. An assembly that has a fire-resistant rating of not less than 2 hours.

   **Exception:** Where the building is protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, the required fire-resistance rating shall be reduced to 1 hour.

**Commenter’s Reason:** This proposal is intended to require fuel lines supplying a generator set inside a building to be separated with fire-resistance-rated construction from areas of the building other than in the room in which the generator is located. It also combines the purpose and intent of both F79 and F378 into one public comment, including the introduction of a new UL standard as proposed in F378.

The original proposal on F79 was recommended for disapproval because it would have applied to all buildings; however, this modification limits the requirement to high-rise buildings. With this revision, it mirrors the text that was approved for the 2015 IBC in Section 403.4.8.2 for high-rises and was overwhelmingly supported by the ICC membership.

It is common for diesel-fueled generators to supply the generators with a day tank and resupply the day tank via remote fuel oil tanks. The fuel line piping from those remote tanks to the generator can be exposed to the same fire incident that the generator has been protected against. Loss of the fuel line due to fire exposure has the same impact as loss of the generator itself.

The original proposal on F378 was intended to introduce a new standard into the International Fire Code for piping systems that convey combustible liquids, which is applicable to this proposal. Products that could comply with the section, when required, are traditionally some variation of fire-resistance-rated horizontal or vertical shaft enclosures, or a fire-resistant pipe-protection system tested in accordance with UL 1489. The public comment would require that such fire resistant systems are tested to UL 1489, and installed in accordance with the manufacturer's installation instructions.

At the time of the ICC deadline for proposals in January 2016, this standard was a UL Outline of Investigation. Since that time, it has completed the ANSI consensus standard process.

**Analysis:** UL 1489-2015 Outline of Investigation for Fire Resistant Pipe Protection Systems Carrying Combustible Liquids was supplied by the proponent as a consensus draft of Standard UL1489 in conjunction with Code Change Proposal #F378-16. The standard has been completed and is available at UL 1489 (http://www.comm-2000.com/ProductDetail.aspx?UniqueKey=29773).

**Public Comment 2:**

**Proponent:** Vickie Lovell, InterCode Incorporated, representing 3M (vickie@intercodeinc.com) requests Approve as Modified by this Public Comment.

**Modify as Follows:**

2015 International Fire Code

604.1.2 (IBC [F] 2702.1.2) Fuel line piping protection. Fuel lines supplying a generator set inside a high-rise building shall be separated from areas of the building other than the room the generator is located in by an approved method, or an assembly that has a fire-resistance rating of not less than 2 hours. Where the building is protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, the required fire-resistance rating shall be reduced to 1 hour.
**Commenter's Reason:** This proposal is intended to require fuel lines supplying a generator set inside a high-rise building to be separated with fire-resistance-rated construction from areas of the building other than in the room in which the generator is located. The original proposal would have applied to all buildings; however, this modification limits the requirement to high-rise buildings. With this revision, it exactly mirrors the text that was approved for the 2015 IBC in Section 403.4.8.2 for high-rises and was overwhelmingly supported by the ICC membership.

It is common for diesel-fueled generators to supply the generators with a day tank and resupply the day tank via remote fuel oil tanks. The fuel line piping from those remote tanks to the generator can be exposed to the same fire incident that the generator has been protected against. Loss of the fuel line due to fire exposure has the same impact as loss of the generator itself. The wording only refers to “fuel lines” to also provide protection in those cases where a gaseous fuel supply is approved for use.

This public comment is intended to correlate the 2015 IFC with the 2015 IBC section that contains the following new text in Chapter 4:

[F] 403.4.8.2 Fuel line piping protection. Fuel lines supplying a generator set inside a building shall be separated from areas of the building other than the room the generator is located in by an approved method or assembly that has a fire-resistance rating of not less than 2 hours. Where the building is protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the required fire-resistance rating shall be reduced to 1 hour.
Committee Action: Disapproved

Assembly Action: None

F80-16 : 605.3.1

Proposed Change as Submitted

Proponent: Jonathan Roberts (jonathan.roberts@ul.com)

2015 International Fire Code

Add new text as follows:

605.3.1 Labeling. Doors into electrical control panel rooms shall be marked with a plainly visible and legible sign stating ELECTRICAL ROOM or similar approved wording. The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident. Buildings or structures supplied by more than one power source shall be marked to indicate the presence of all power sources in accordance with NFPA 70.

Reason: The current IFC does not specifically address providing markings to identify multiple powers sources. Multiple power sources are becoming a more common hazard to first responders. Understanding that buildings or structures fed from multiple power sources is a hazard to first responders. It is important to know where the building or structure is supplied by alternate energy sources. Without this marking, by just turning off the main disconnect, it may be assumed that the building or structure has been fully deenergized. However there may still be energized systems that pose a serious hazard to first responders.

Cost Impact: Will not increase the cost of construction
There is no increase in cost as this marking is already required by NFPA 70.

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The proposal was disapproved with concern that the location of the signage was unclear. There was concern that the building itself would need to be marked which did not appear to be the intent. More specificity was requested for the location of the signage.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Jonathan Roberts (jonathan.roberts@ul.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

605.3.1 Labeling. Doors into electrical control panel rooms shall be marked with a plainly visible and legible sign stating ELECTRICAL ROOM or similar approved wording. The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident. Buildings or structures supplied by more than one power source shall be marked to indicate the presence of provided at each service equipment location and at all interconnected electric power production sources identifying all electric power sources at the premises in accordance with NFPA 70.

Commenter's Reason: The committee disapproved the proposal because they felt the location of the signage was unclear. They also requested more specificity about the location of the signage. This comment addresses their concerns by including applicable location information for the signage that is based on NFPA 70, Section 705.10 requirements.

F80-16
Committee Action: Approved as Submitted

Assembly Action: None

F82-16 : 605.5-
ROBERTS10751

Proposed Change as Submitted

Proponent: Jonathan Roberts (jonathan.roberts@ul.com)

2015 International Fire Code

Add new text as follows:

605.5 Extension cords. Extension cords and flexible cords shall not be a substitute for permanent wiring and shall be listed and labeled in accordance with UL 817. Extension cords and flexible cords shall not be affixed to structures, extended through walls, ceilings or floors, or under doors or floor coverings, nor shall such cords be subject to environmental damage or physical impact. Extension cords shall be used only with portable appliances. Extension cords marked for indoor use shall not be used outdoors.

Reference standards type: This reference standard is new to the ICC Code Books

Add new standard(s) as follows: Add new standard. UL 817, Standard for Cord Sets and Power-Supply Cords with revisions through March 2015

Reason: This proposal allows fire code enforcers to require extension cords to be listed and labeled, which demonstrates they have been investigated in accordance with recognized safety standards, and addresses hazards associated with non-listed extension codes that may utilize undersized conductors and substandard construction. The proposal also addresses fire and shock hazards associated with use of indoor use extension cords used in outdoor environments.

Cost Impact: Will not increase the cost of construction

This proposal simply clarifies the safety requirements for extension cords allowed for temporary use.

Public Hearing Results

Committee Action: Approved as Submitted

Committee Reason: The proposal was approved as it provides a necessary listing standard for extension cords regardless of the concern that the healthcare industry needs additional standards referenced for their industry.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: John Williams, CBO, representing Adhoc Healthcare Committee (AHC@iccsafe.org) requests Approve as Modified by this Public Comment.

Further Modify as Follows:

2015 International Fire Code

605.5 Extension cords. Extension cords and flexible cords shall not be a substitute for permanent wiring and shall be listed and labeled in accordance with UL 817. Extension cords and flexible cords shall not be affixed to structures, extended through walls, ceilings or floors, or under doors or floor coverings, nor shall such cords be subject to environmental damage or physical impact. Extension cords shall be used only with portable appliances. Extension cords marked for indoor use shall not be used outdoors.

Exception: Extensions cords and flexible cords in Group I-2 occupancies and ambulatory care facilities are not required to be listed and labeled in accordance with UL 817.

Commenter's Reason: In nursing homes, hospitals and ambulatory care facilities, extension cords are required to comply with UL60601-1, UL1363A or UL1363, depending on location and movement of equipment. This cycle does not allow for an introduction of these new standards at this time. However, asking for compliance with UL817 would be a conflict with Center for Medicare/Medicaid Services (CMS) requirements. Therefore, we are requesting an exception for these facilities. The Adhoc Health Care Committee will come forward next cycle with a proposal to add criteria that Group I-2 facilities have to comply with to match federal requirements.

F82-16
F86-16 Part I
IFC: 605.11, 605.11.1.2, 605.11.1.2.1, 605.11.1.3.1, 605.11.2.

Proposed Change as Submitted

(billbrooks7@sbcglobal.net)

2015 International Fire Code

605.11.1.2 Solar photovoltaic PV systems for Group R-3 buildings. Solar photovoltaic PV systems for Group R-3 buildings shall comply with Sections 605.11.1.2.1 through 605.11.1.2.5.

Exception: These requirements shall not apply to structures designed and constructed in accordance with the International Residential Code.

605.11.1.2.1 Size of solar photovoltaic PV array. Each photovoltaic PV array shall be limited to 150 feet (45 720 mm) by 150 feet (45 720 mm). Multiple arrays shall be separated by a 3-foot-wide (914 mm) clear access pathway.

605.11.2 Ground-mounted photovoltaic PV arrays. Ground-mounted photovoltaic PV arrays shall comply with Section 605.11 and this section. Setback requirements shall not apply to ground-mounted, free-standing photovoltaic PV arrays. A clear, brush-free area of 10 feet (3048 mm) shall be required for ground-mounted photovoltaic PV arrays.

605.11 Solar photovoltaic power systems. Solar photovoltaic (PV) power systems shall be installed in accordance with Sections 605.11.1 through 605.11.2, the International Building Code or International Residential Code, and NFPA 70.

605.11.1.3.1 Access. There shall be a minimum 6-foot-wide (1829 mm) clear perimeter around the edges of the roof.

- Exception: Where either axis of the building is 250 feet (76 200 mm) or less, the clear perimeter around the edges of the roof shall be permitted to be reduced to a minimum 4 foot wide (1290 mm).

Reason: The term “photovoltaic” is rarely used and is shortened to “PV” for ease of reference throughout NFPA 70 and should be done throughout 605.11. The same change was set forth in another proposal related to 605.11 to establish the first use of the term acronym in that section.

Cost Impact: Will not increase the cost of construction
This is an editorial change.

Public Hearing Results

Part I

Committee Action: Approved as Submitted

Committee Reason: This proposal was approved as it was simply a terminology clean up to be consistent with industry. There was a concern raised that this needs to be addressed throughout the codes for consistency.

Assembly Action: None

Individual Consideration Agenda

Proponent: Joseph Cain, representing Solar Energy Industries Association (SEIA) (JoeCainPE@gmail.com) requests Disapprove.

Commenter's Reason: F86-16 is a two-part proposal. Part I was heard by the Fire Committee, and was Approved As Submitted. However, the ROCAH expresses a concern that the abbreviation "PV" is introduced into the code in only certain subsections by F86-16, it creates inconsistencies with many other sections of the IFC, IBC, and IRC that use "photovoltaic" spelled out as a defined term. In considering this public comment, the reader should consider that although NFPA 70 (the NEC) uses "PV" in many portions of the code, the I-codes do not. Proposal F86-16 Part I includes the abbreviation "PV" in only four subsections of the IFC, and leaves all other occurrences of "photovoltaic" intact. In Committee discussion, this caused some confusion.

The Part I committee reason is repeated below.
Part I Committee Reason: This proposal was approved as it was simply a terminology clean up to be consistent with industry. There was a concern raised that this needs to be addressed throughout the codes for consistency.

Part II was heard by the IRC-Building Code Committee. The IRC-B Committee disapproved F86-16 Part II, with the following Committee Reason.

Part II Committee Reason: These changes are unnecessary and are not consistent throughout the code. Photovoltaic is a defined term in the code and PV is not.

Until such time as a sweeping revision through all of the I-codes is attempted to make “PV” a common reference in these codes, the Solar Energy Industries Association recommends disapproval of F86-16 Part I.
2015 International Residential Code

R324.3 Photovoltaic systems. Photovoltaic (PV) systems shall be designed and installed in accordance with Sections R324.3.1 through R324.6.1 and NFPA 70. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.

R324.3.1 Equipment listings. Photovoltaic PV panels and modules shall be listed and labeled in accordance with UL 1703.

R324.4 Rooftop-mounted photovoltaic systems. Rooftop-mounted photovoltaic PV panel systems installed on or above the roof covering shall be designed and installed in accordance with Section R907.

R324.4.1 Roof live load. Roof structures that provide support for photovoltaic PV panel systems shall be designed for applicable roof live load. The design of roof structures need not include roof live load in the areas covered by photovoltaic panel systems. Portions of roof structures not covered by photovoltaic PV panels shall be designed for roof live load. Roof structures that provide support for photovoltaic PV panel systems shall be designed for live load, LR, for the load case where the photovoltaic PV panel system is not present.

R324.5 Building-integrated photovoltaic systems. Building-integrated photovoltaic PV systems that serve as roof coverings shall be designed and installed in accordance with Section R905.

R324.5.1 Photovoltaic PV shingles. Photovoltaic PV shingles shall comply with Section R905.16.

R324.6 Ground-mounted photovoltaic PV systems. Ground-mounted photovoltaic PV systems shall be designed and in-stalled in accordance with Section R301.

R324.6.1 Fire separation distances. Ground-mounted photovoltaic PV systems shall be subject to the fire separation distance requirements determined by the local jurisdiction.

Reason: The term “photovoltaic” is rarely used and is shortened to “PV” for ease of reference throughout NFPA 70 and should be done throughout 605.11. The same change was set forth in another proposal related to 605.11 to establish the first use of the term and acronym in that section.

Cost Impact: Will not increase the cost of construction
This is an editorial change.
Proposed Change as Submitted

Proponent: William Brooks, Brooks Engineering, representing Photovoltaic Industry Code Council (billbrooks7@sbcglobal.net)

2015 International Fire Code
Add new text as follows:

605.11.3 **Buildings with Rapid Shutdown** Buildings with solar PV systems, shall have permanent labels in accordance with Sections 605.11.3.1 through 605.11.3.3.

605.11.3.2 **Buildings with more than one rapid shutdown type.** For buildings that have PV systems with both rapid shutdown types or a PV system with a rapid shutdown type and a PV system with no rapid shutdown, a detailed plan view diagram of the roof shall be provided showing each different PV system and a dotted line around areas that remain energized after the rapid shutdown switch is operated.

605.11.3.3 **Rapid shutdown switch.** A rapid shutdown switch shall have a label located not greater than 1 meter (3 ft) from the switch that states the following: RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

605.11.3.1 **Rapid shutdown type.** The type of PV system rapid shutdown shall be labeled with one of the following:

1. For PV systems that shutdown the array and conductors leaving the array a label shall be provided. The first two lines of the label shall be capitalized characters with a minimum height of 9.5 mm (3/8 in.) in black on yellow background and the remaining characters shall be capitalized with a minimum height of 4.8 mm (3/16 in.) in black on white background. The label shall be in accordance with Figure 605.11.3.1(1) and state the following:
   
   SOLAR PV SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN
   TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION
   TO SHUTDOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN ARRAY.

2. For PV systems that only shutdown conductors leaving the array a label shall be provided. The first two lines of the label shall be capitalized characters with a minimum height of 9.5 mm (3/8 in.) in white on red background and the remaining characters shall be capitalized with a minimum height of 4.8 mm (3/16 in.) in black on white background. The label shall be in accordance with Figure 605.11.3.1(2) and state the following:
   
   SOLAR PV SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN
   TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION
   TO SHUTDOWN CONDUCTORS OUTSIDE THE ARRAY. CONDUCTORS IN ARRAY REMAIN ENERGIZED IN SUNLIGHT.

605.11.3.1.2 **Location.** The rapid shutdown label in 605.11.3.1 shall be located not greater than 1 meter (3 ft) from the service disconnecting means to which the PV systems are connected, and shall indicate the location of all identified rapid shutdown switches if not at the same location.

605.11.3.1.1 **Diagram.** The labels in 605.11.3.1 shall include a simple diagram of a building with a roof. Diagram sections in red signify sections of the PV system that are not shutdown when the rapid shutdown switch is turned off.

FIGURE 605.11.3.1(2)

**LABEL FOR PV SYSTEMS THAT ONLY SHUTDOWN CONDUCTORS LEAVING THE ARRAY**
**Reason:** These new marking requirements for Rapid Shutdown PV systems were initially developed by the NFPA Fire Fighter Safety and PV Systems Task Group that was reorganized in December of 2014. This collaborative Task Group is working on proposals for NFPA1, NFPA70, and other related documents. This Task Group is made up of over 20 participants from Code Enforcement, Utilities, and Manufacturers.
Making Panel 4 of the NFPA70, the solar industry, the fire service, the insurance industry, test laboratories, and other relevant stakeholders.

The Rapid Shutdown marking requirements proposed in this second revision input includes the language for these signs and greyscale figures of the color signs to print in the Code. Actual examples of these signs will exist in the handbook of the 2017 NEC Handbook for section 690.56(C) and the Annex of NFPA1, 2018 edition. The signs are provided in the attachment so that reviewers can visualize what the signs are intended to look like.

Two different signs are required on buildings depending on what type of rapid shutdown system is on the building. Systems with multiple rapid shutdown types will be required to have a detailed directory since a simple sign will not be sufficient to clarify the levels of hazard on the roof.

Lastly, all switches that are intended to be used as rapid shutdown switches shall be labeled with the words, “RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM.”

**Cost Impact:** Will increase the cost of construction
The manufacturing of signs and applying those signs at the appropriate locations does add a small cost to a solar PV system. This cost is appropriate given value of helping emergency responders understand the level of hazard they will encounter with a PV system.

**Public Hearing Results**

**Part I**

<table>
<thead>
<tr>
<th>Committee Action:</th>
<th>Approved as Submitted</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Committee Reason:</strong></td>
<td>The provisions need work but having this as a starting point is necessary. The fire department needs to understand what they are dealing with in terms of the types of systems. The NEC currently does not address this signage. There were some concerns such as how the scoping section relates to the requirements within the section and general concerns with how the section is written.</td>
</tr>
<tr>
<td>Assembly Action:</td>
<td>None</td>
</tr>
</tbody>
</table>

**Individual Consideration Agenda**

**Proponent:** Rebecca Baker, representing Jefferson County, CO / Colorado Chapter of the International Code Council (bbaker@co.jefferson.co.us) requests Disapprove.

**Commenter's Reason:** There are requirements for PV rapid shutdown signage in the 2014 NEC. It will be problematic if this code has different requirements than the NEC.
Proposed Change as Submitted

Proponent: William Brooks, Brooks Engineering, representing Photovoltaic Industry Code Council (billbrooks7@sbcglobal.net)

2015 International Residential Code

Add new text as follows:

R324.4 Buildings with Rapid Shutdown. Buildings with solar PV systems shall have permanent labels in accordance with Sections R324.4.1 through R324.4.3.3

R324.4.1 Rapid shutdown type. The type of PV system rapid shutdown shall be labeled with one of the following:

1. For PV systems that shutdown the array and conductors leaving the array a label shall be provided. The first two lines of the label shall be capitalized characters with a minimum height of 9.5 mm (3/8 in.) in black on yellow background and the remaining characters shall be capitalized with a minimum height of 4.8 mm (3/16 in.) in black on white background. The label shall be in accordance with Figure 605.11.3.1(1) and state the following:

SOLAR PV SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN
TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION
TO SHUTDOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN ARRAY.

2. For PV systems that only shutdown conductors leaving the array a label shall be provided. The first two lines of the label shall be capitalized characters with a minimum height of 9.5 mm (3/8 in.) in white on red background and the remaining characters shall be capitalized with a minimum height of 4.8 mm (3/16 in.) in black on white background. The label shall be in accordance with Figure 605.11.3.1(2) and state the following:

SOLAR PV SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN
TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION
TO SHUTDOWN CONDUCTORS OUTSIDE THE ARRAY, CONDUCTORS IN ARRAY REMAIN ENERGIZED IN SUNLIGHT.

R324.4.1.1 Diagram. The labels in R324.4.1 shall include a simple diagram of a building with a roof. Diagram sections in red signify sections of the PV system that are not shutdown when the rapid shutdown switch is turned off.

R324.4.1.2 Location. The rapid shutdown label in R324.4.1 shall be located not more than 1 meter (3 ft) from the service disconnecting means to which the PV systems are connected, and shall indicate the location of all identified rapid shutdown switches if not at the same location.

R324.4.2 Buildings with more than one rapid shutdown type. For buildings that have PV systems with both rapid shutdown types or a PV system with a rapid shutdown type and a PV system with no rapid shutdown, a detailed plan view diagram of the roof shall be provided showing each different PV system and a dotted line around areas that remain energized after the rapid shutdown switch is operated.

R324.4.3 Rapid shutdown switch. A rapid shutdown switch shall have a label located not more than 1 meter (3 ft) from the switch that states the following: RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM
Reason: These new marking requirements for Rapid Shutdown PV systems were initially developed by the NFPA Fire Fighter Safety and PV Systems Task Group that was reorganized in December of 2014. This collaborative Task Group is working on proposals for NFPA1, NFPA70, and other related documents. This Task Group is made up of over 20 participants from Code Making Panel 4 of the NFPA70, the solar industry, the fire service, the insurance industry, test laboratories, and other relevant
The Rapid Shutdown marking requirements proposed in this second revision input includes the language for these signs and greyscale figures of the color signs to print in the Code. Actual examples of these signs will exist in the handbook of the 2017 NEC Handbook for section 690.56(C) and the Annex of NFPA1, 2018 edition. The signs are provided in the attachment so that reviewers can visualize what the signs are intended to look like.

Two different signs are required on buildings depending on what type of rapid shutdown system is on the building. Systems with multiple rapid shutdown types will be required to have a detailed directory since a simple sign will not be sufficient to clarify the levels of hazard on the roof.

Lastly, all switches that are intended to be used as rapid shutdown switches shall be labeled with the words, "RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM."

**Cost Impact:** Will increase the cost of construction

The manufacturing of signs and applying those signs at the appropriate locations does add a small cost to a solar PV system. This cost is appropriate given value of helping emergency responders understand the level of hazard they will encounter with a PV system.

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**Public Hearing Results**

**Part II**

**Committee Action:** Disapproved

**Committee Reason:** These electrical requirements do not belong in the International Residential Code. They are more appropriate for NFPA 70. In any case, such requirements should be finalized by in the National Electrical Code before being considered for inclusion in the International Residential Code.

**Assembly Motion:** As Submitted

**Online Vote Results:**

Support: 50.17% (147) Oppose: 49.83% (146)

**Assembly Action:** Approved as Submitted

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**Individual Consideration Agenda**

**Proponent:** Assembly Motion requests Approve as Submitted.

**Commenter's Reason:** This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly motion. The assembly action for Approve as Submitted was Successful by a vote of 50.17% (147) to 49.83% (146) by eligible members online during the period of May 11 - May 26, 2016.

**Proponent:** Rebecca Baker, representing Jefferson County, CO / Colorado Chapter of the International Code Council (bbaker@co.jefferson.co.us) requests Disapprove.

**Commenter's Reason:** There are requirements for PV rapid shutdown signage in the 2014 NEC. It will be problematic if this code has different requirements than the NEC.
Proposed Change as Submitted

Proponent: Jim Tidwell, Tidwell Code Consulting, representing Honeywell (jimtidwell@tccfire.com)

2015 International Fire Code

Add new text as follows:

606.13 Discharge location for refrigeration machinery room ventilation. Exhaust from mechanical ventilation systems serving refrigeration machinery rooms containing flammable, toxic or highly toxic refrigerants, other than ammonia, capable of exceeding 25 percent of the LFL or 50 percent of the IDLH shall be equipped with approved treatment systems to reduce the discharge concentrations to those values or lower.

Exception: Refrigeration systems containing Group A2L complying with Section 606.17.

Revise as follows:

606.16 Electrical equipment. Where refrigerants of Groups A2, A3, B2 and B3, as defined in the International Mechanical Code, are used, refrigeration machinery rooms shall conform to the Class I, Division 2 hazardous location classification requirements of NFPA 70.

Exceptions:
1. Ammonia machinery rooms that are provided with ventilation in accordance with Section 1106.3 of the International Mechanical Code.
2. Machinery rooms for systems containing Group A2L refrigerants that are provided with ventilation in accordance with Section 606.17.

Add new text as follows:

606.17 Group A2L Refrigerants. Mechanical refrigeration systems using Group A2L refrigerants shall also comply with Sections 606.17.1 and 606.17.4.

606.17.1 Machinery rooms. Machinery rooms with systems containing Group A2L refrigerants shall comply with Section 606.17.2 through 606.17.3

Exception: Machinery rooms conforming to the Class 1, Division 2, hazardous location classification requirements of NFPA 70.

606.17.2 Refrigerant detection system. The machinery room shall be provided with a refrigerant detection system. The refrigerant detection system shall be in accordance with Section 606.8 and all of the following:

a. The detectors shall activate at or below a refrigerant concentration of 25% of the LFL.
b. Upon activation, the detection system shall activate the emergency ventilation system in Section 606.17.3
c. The detection, signaling and control circuits shall be supervised.

606.17.3 Emergency Ventilation System. An emergency ventilation system shall be provided at the minimum exhaust rate specified in Table 606.17.3. Shut down of the emergency ventilation system shall be by manual means.

<table>
<thead>
<tr>
<th>Refrigerant</th>
<th>Q(m³/sec)</th>
<th>Q(cfm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R32</td>
<td>15.4</td>
<td>32,600</td>
</tr>
<tr>
<td>R143a</td>
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<tr>
<td>R1234yf</td>
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</tr>
<tr>
<td>R1234ze(E)</td>
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</tbody>
</table>
606.17.3 Emergency Ventilation system discharge. The point of discharge to the atmosphere shall be located outside of the structure at not less than 15 feet (4572 mm) above the adjoining grade level and not less than 20 feet (6096 mm) from any window, ventilation opening or exit.

Reason: This proposal provides necessary changes to permit a new class of refrigerants with very low flammability characteristics in refrigerant machinery rooms. This proposal leaves intact the code requirements for refrigerants elsewhere. This change simply allows Group 2L refrigerants in refrigeration machinery rooms to comply with the current code requirements for Group 1, Division 2 Electrical systems, or install detection and ventilation systems to mitigate the hazard. This is similar to the mitigation scheme for many other hazardous operations, including repair garages (2311.4.3), hazardous materials (dozens of examples), compressed gases, corrosives, etc. This is a common and accepted mitigation scheme within the IFC and other codes.

Federal agencies have begun limiting the use of refrigerants that have high global warming potential (GWP) properties. Industry has responded by developing a number of replacement refrigerants. One of the characteristics of most of these products is that they are minimally flammable. Proven protection schemes are available to mitigate the reduced risk posed by these products, and are included in this code change proposal.

The codes (IMC, IFC, ASHRAE) have historically classified the flammability of refrigerants as Group 1 (nonflammable), Group 2 (moderately flammable), and Group 3 (highly flammable). Because the newly developed environmentally preferred refrigerants present a significantly lower hazard than class 2 refrigerants, a new classification was established for them. The new flammability classification is 2L. In addition to flammability, the codes classify refrigerants as either nontoxic (A) or toxic (B). The new refrigerants are primarily classified as A2L - nontoxic, mildly flammable. Table 1103.1 in the IMC recognizes 2L refrigerants as a sub-class of group 2.

The 2L refrigerants have a burning velocity of less than 10 cm/sec. The energy required for ignition is very high, and the pressure rise is much less than refrigerants with a higher flammability, resulting in a far safer product than current Group 2 refrigerants. Historically, ammonia was the only widely used refrigerant with these burning characteristics. The IFC and other codes recognize this, and have made a number of exceptions for ammonia. These exceptions are based upon the fact that its burning characteristics reduce the risk of ignition, and the risk of damage should ignition occur is greatly reduced. These risks are further reduced by code requirements for detection and ventilation. The fire history for ammonia is excellent where these mitigation measures have been in place - the mitigation measures are working to minimize the fire risks associated with the product.

This proposal provides similar mitigation measures for products with similar burning characteristics. The ventilation rates are based upon research that clearly shows that the rates will maintain a safe environment in over 90% of the leaks. This level of protection is more than adequate. Utilizing the same protection scheme for other 2L refrigerants provides the same level of safety as that for ammonia, and adheres to the philosophy of maintaining a level playing field for industry. Below are some graphs and charts showing the properties of various refrigerants under discussion:
Severity – Related Properties

Flammability is evaluated by ‘Chance of Flame occurring’ and ‘Effect of Flame occurring’

- Effect of Flame occurring -> Burning Velocity, Heat of Combustion

![Graph showing flammability properties]

HFO-1234yf is classified in Class 2L (Low Burning Velocity)
Likelihood of Ignition – Related Properties

Flammability is evaluated by ‘Chance of Flame occurring’ and ‘Effect of Flame occurring’
- Chance of Flame occurring -> **Lower Flame Limit, Minimum Ignition Energy**

![Graph showing minimum ignition energy and lower flame limit for various substances.](image)

**Difficult to ignite HFO-1234yf due to high Minimum Ignition Energy**
Specifically, the proposal includes:

606.13: adds a new exception for A2L refrigerants; the body of the paragraph already exempts ammonia from this requirement, thus it's appropriate to exempt other 2L refrigerants, as the fire hazard is the same.

606.16: adds a new exception for A2L refrigerants; an exception already exists for ammonia and the code should treat all 2L's similarly. The ventilation requirements are founded in published research.

606.17 contains the mitigation criteria for hazards associated with A2L refrigerants. This section requires that 2L refrigerants used in machinery rooms to either meet Class 1, Division 2 electrical classification or be provided with early detection and ventilation to dilute the refrigerant.

606.17.2 specifies the detection criteria for machinery rooms where A2L refrigerants are used; these requirements include supervision of all circuits.

606.17.3 provides specific criteria for the ventilation requirements. These criteria, including the table, are founded in research conducted by UTC/Carrier. This is widely accepted as the best research on the subject currently available. The ventilation rates in the table are based upon the following formula:

\[ Q \geq \frac{m}{LFL \cdot S} \]

\[ m = \rho \cdot v \cdot A \]

Where variables are defined as:

- \( \omega \) coefficient of discharge
- \( \rho \) lb/R³ refrigerant density per 0.2
- \( v \) R/s refrigerant velocity assuming choked vapor flow conditions, equal to the refrigerant
- \( A \) R² cross-section flow area of refrigerant leak assuming 0.50 in [12.7 mm] circular opening
- \( m \) R/s refrigerant leak mass flow rate
- \( \text{LFL} \) lb/R³ Lower Flammability Limit, or ETFL if no LFL exists, published value
- \( S \) per ASHRAE Standard 34
- \( F \) [-] required air flow rate; conversion to other units of measure is permitted

Cost Impact: Will not increase the cost of construction

Currently, Group 2L refrigerants are treated as Group 2 refrigerants; this proposal provides an additional option for mitigating the risks associated with these products, but does not prohibit the designer or owner from following current code requirements. Because this is optional, it will not increase the cost of construction.
Committee Action: Approved as Modified

Modification:

606.17.3 Emergency Ventilation System An emergency ventilation system shall be provided at the minimum exhaust rate specified in ASHRAE 15 or Table 606.17.3. Shut down of the emergency ventilation system shall be by manual means.

Committee Reason: This proposal was approved as it provides the more specific requirements for A2L refrigerants that are not yet specifically addressed by ASHRAE 15. The use of such refrigerants is becoming more widespread with the changes to the environmental requirements. The modification provides additional correlation with ASHRAE 15, where necessary, by providing a specific reference to the standard. It was encouraged that as the next edition of ASHRAE 15 is finalized that further collaboration on the use of A2L refrigerants is necessary in the IFC is necessary.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Phillip Johnson, representing self (phillip.johnson@daikinapplied.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

606.17.3 Emergency Ventilation System An emergency ventilation system shall be provided at the minimum exhaust rate specified in ASHRAE 15 or Table 606.17.3. Shut down of the emergency ventilation system shall be by manual means.

<table>
<thead>
<tr>
<th>Refrigerant</th>
<th>Q(m³/sec)</th>
<th>Q(cfm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R32</td>
<td>15.4</td>
<td>32,600</td>
</tr>
<tr>
<td>R143</td>
<td>13.6</td>
<td>28,700</td>
</tr>
<tr>
<td>R444A</td>
<td>6.46</td>
<td>13,700</td>
</tr>
<tr>
<td>R444B</td>
<td>10.6</td>
<td>22,400</td>
</tr>
<tr>
<td>R445A</td>
<td>7.93</td>
<td>16,600</td>
</tr>
<tr>
<td>R446A</td>
<td>22.9</td>
<td>50,700</td>
</tr>
<tr>
<td>R447A</td>
<td>23.0</td>
<td>50,400</td>
</tr>
<tr>
<td>R451A</td>
<td>7.04</td>
<td>16,000</td>
</tr>
<tr>
<td>R461B</td>
<td>7.05</td>
<td>16,000</td>
</tr>
<tr>
<td>R1234yf</td>
<td>7.90</td>
<td>16,600</td>
</tr>
<tr>
<td>R1234ze(E)</td>
<td>5.92</td>
<td>12,600</td>
</tr>
</tbody>
</table>

Commenter's Reason: The values in Table 606.17.3 of proposal F93-16 are the same as an older ASHRAE Advisory Public Review (APR) document dated December 2015 for a proposed addendum to ASHRAE Standard 15-2013. Those values are now out of date and do not match the final values in proposed Addendum H to ASHRAE Standard 15-2013 that is expected to go out for first Publication Public Review (PPR1) during August-September 2016. The final ASHRAE proposal revised some of the values based on more recently published refrigerant property data from NIST. The changes only affected refrigerant blends with certain pairs of refrigerant components in the blends, so not all table values were revised. Publishing Table 606.17.3 with different values than ASHRAE Standard 15 would create unnecessary confusion during enforcement. (The final ASHRAE addendum proposal also added six additional group A2L refrigerants that had received ASHRAE designation as of June 2016.) If Addendum H to ASHRAE Standard 15-2013 is approved before the end of 2016, the ventilation exhaust rate information will be included in ASHRAE Standard 15-2016 and there would be no need for Table 606.17.3. [This comment may be withdrawn prior to consideration at the Public Comment Hearing if at a later date it becomes clear that the ASHRAE proposed addendum is not expected to be approved and published. In that case, some incorrect values and missing values in Table 606.17.3 are preferred to no values in either ASHRAE Standard 15-2016 or ICC IFC 2018.]
Excerpt from the ASHRAE advisory public review draft (some values now out of date):

G.4 Table G.4 lists airflow calculated per G.1 for G.2 case (a).
[editorial note: this table is for A2L only as of this draft, all refrigerants will be added to the final table]

Table G.4 Machinery Room Ventilation Airflow

<table>
<thead>
<tr>
<th>Refrigerant</th>
<th>Minimum Airflow (ft³/min)</th>
<th>Minimum Airflow (m³/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R32</td>
<td>543</td>
<td>32,600</td>
</tr>
<tr>
<td>R143a</td>
<td>478</td>
<td>28,700</td>
</tr>
<tr>
<td>R444A</td>
<td>228</td>
<td>13,700</td>
</tr>
<tr>
<td>R444B</td>
<td>374</td>
<td>22,400</td>
</tr>
<tr>
<td>R445A</td>
<td>277</td>
<td>16,600</td>
</tr>
<tr>
<td>R446A</td>
<td>844</td>
<td>50,700</td>
</tr>
<tr>
<td>R447A</td>
<td>840</td>
<td>50,400</td>
</tr>
<tr>
<td>R451A</td>
<td>249</td>
<td>15,000</td>
</tr>
<tr>
<td>R451B</td>
<td>249</td>
<td>15,000</td>
</tr>
<tr>
<td>R717</td>
<td>Note 1</td>
<td>Note 1</td>
</tr>
<tr>
<td>R1234yf</td>
<td>276</td>
<td>16,600</td>
</tr>
<tr>
<td>R1234ze(E)</td>
<td>209</td>
<td>12,600</td>
</tr>
</tbody>
</table>

Note 1: Thirty (30.0) air changes per hour.


Analysis: It should be noted that the 2016 edition of ASHRAE 15 is included in code change proposal ADM94-16.

Public Comment 2:

Proponent: Phillip Johnson, Daikin Applied, representing self (phillip.johnson@daikinapplied.com) requests Approve as Modified by this Public Comment.

Further Modify as Follows:

2015 International Fire Code

606.17.2 Refrigerant detection system. The machinery room shall be provided with a refrigerant detection system. The refrigerant detection system shall be in accordance with Section 606.8 and all of the following:

a. The detectors shall activate at or below a refrigerant concentration of 25% of the LFL.

b. Upon activation, the detection system shall activate the emergency ventilation system in Section 606.17.3.

e. b. The detection, signaling and control circuits shall be supervised.

Commenter’s Reason: Proposed Section 606.17.2(a.) requires that refrigerant detectors activate at or below 25% of the LFL when using Group A2L refrigerants. This requirement will always be effectively superseded by Section 606.8, which requires activation “at a value not greater than the corresponding TLV-TWA values shown in the International Mechanical Code for the refrigerant classification”, because the TLV-TWA for all group A2L refrigerants is much lower than 25% of the LFL.

If the original proposal would be further modified to always use 25% of LFL for A2L refrigerants, to not use the TLV-TWA value for A2L refrigerants, then it would create a situation where the code is more stringent for A1 refrigerants than A2L refrigerants.
the intent of the proposer really is to relax the requirements and to allow higher refrigerant concentration before activating refrigerant detectors, then it would make more sense for consistency to relax it for all refrigerants and to use the RCL instead of the TLV-TWA (where the RCL per ASHRAE Standard 34 corresponds to the “amount of refrigerant per occupied space” found in IMC Table 1103.1). However, this public comment does not advocate that approach at this time (not without further study or research). One possible future solution is to use a two step approach, with a lower ventilation rate triggered by OEL (TLV-TWA) to address less urgent small leaks where the relevant exposure time risk is on the order of hours or days, and a higher “emergency” ventilation rate triggered by RCL.

Published research (Petersen et.al. 2012, Papas et.al. 2016) on machinery room ventilation has used the OEL (TLV-TWA) or a fraction of the OEL as the set point to trigger ventilation. Petersen et.al. used TLV-TWA to trigger ventilation, or 10% of RCL when no TLV-TWA value was available. Papas et.al. used 70% of OEL to trigger ventilation in their CFD study (exceeding the code requirement by using a lower value). Private research by AHRI (AHRI 2013), but authorized for release to members of ASHRAE SSPC 15 and SSPC34, also assumed an ASHRAE Standard 15-2010 compliant mechanical room for its risk assessment, so it also assumed use of TLV-TWA as the trigger point for ventilation. I can find no technical justification to use 25% of the LFL for refrigerants in machinery room applications (notwithstanding the concept mentioned above, using a two step or tiered approach). The current use of TLV-TWA (changing to OEL), a relatively low concentration, may occasionally lead to nuisance trips related to small refrigerant leaks, but errs on the side of being conservatively safe; in the case of larger leaks, due to catastrophic part rupture, TLV-TWA triggers ventilation slightly earlier and reduces the risk (for flammable refrigerants it will reduce the flammable mass and reduce the time that a flammable mass exists).

For reference, review the values in IMC 2015 Table 1103.1 (and pending values for IMC 2018 Table 1103.1), and for additional reference on relatively new A2L refrigerants also see ASHRAE Standard 34-2013 and published addenda as of June 2016. Below are values for all currently available A2L refrigerants showing that TLV-TWA (OEL) is always much lower than 25% of LFL.

<table>
<thead>
<tr>
<th>Refrigerant</th>
<th>Safety Group (ASHRAE 34-2013)</th>
<th>TLV-TWA (ppm)</th>
<th>OEL (ppm)</th>
<th>25% of LFL (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-32</td>
<td>A2L</td>
<td>1000</td>
<td>1000</td>
<td>36000</td>
</tr>
<tr>
<td>R-143a</td>
<td>A2L</td>
<td>1000</td>
<td>1000</td>
<td>21000</td>
</tr>
<tr>
<td>R-1234yf</td>
<td>A2L</td>
<td>500</td>
<td>500</td>
<td>16000</td>
</tr>
<tr>
<td>R-1234ze(E)</td>
<td>A2L</td>
<td>800</td>
<td>800</td>
<td>16000</td>
</tr>
<tr>
<td>R-444A</td>
<td>A2L</td>
<td>(2018) 850</td>
<td>850</td>
<td>21000</td>
</tr>
<tr>
<td>R-444B</td>
<td>A2L</td>
<td>(2018) 890</td>
<td>(Add. h) 890</td>
<td>(Add. h) 23000</td>
</tr>
<tr>
<td>R-445A</td>
<td>A2L</td>
<td>(2018) 930</td>
<td>930</td>
<td>16000</td>
</tr>
<tr>
<td>R-446A</td>
<td>A2L</td>
<td>(2018) 960</td>
<td>(Add. b) 960</td>
<td>(Add. b) 16000</td>
</tr>
<tr>
<td>R-447A</td>
<td>A2L</td>
<td>(2018) 900</td>
<td>(Add. c) 900</td>
<td>(Add. c) 16000</td>
</tr>
<tr>
<td>R-451A</td>
<td>A2L</td>
<td>(2018) 520</td>
<td>(Add. j) 520</td>
<td>(Add. j) 18000</td>
</tr>
<tr>
<td>R-451B</td>
<td>A2L</td>
<td>(2018) 530</td>
<td>(Add. k) 530</td>
<td>(Add. k) 18000</td>
</tr>
<tr>
<td>R-452B</td>
<td>A2L</td>
<td>(Add. af) 870</td>
<td>(Add. af) 30000</td>
<td></td>
</tr>
<tr>
<td>R-454A</td>
<td>A2L</td>
<td>(Add. s) 660</td>
<td>(Add. s) 16000</td>
<td></td>
</tr>
<tr>
<td>R-454B</td>
<td>A2L</td>
<td>(Add. t) 850</td>
<td>(Add. t) 19000</td>
<td></td>
</tr>
<tr>
<td>R-454C</td>
<td>A2L</td>
<td>(Add. z) 620</td>
<td>(Add. z) 19000</td>
<td></td>
</tr>
<tr>
<td>R-455A</td>
<td>A2L</td>
<td>(Add. v) 650</td>
<td>(Add. v) 30000</td>
<td></td>
</tr>
<tr>
<td>R-457A</td>
<td>A2L</td>
<td>(Add. ah) 650</td>
<td>(Add. ah) 15000</td>
<td></td>
</tr>
</tbody>
</table>

1 TLV-TWA value shown is the OEL per IMC 2015 Table 1103.1, and where indicated per M116-15 which was approved as submitted and will be included in IMC 2018 Table 1103.1
2 OEL value shown is per ASHRAE Standard 34-2013, and where indicated per approved and published addendum to that standard
3 value for 25% of LFL is approximate, taken as the RCL from ASHRAE 34-2013, and where indicated per approved and published addendum to that standard; note that RCL for most flammable refrigerants is based on the FCL and that FCL = 25% x LFL

Bibliography:
(ASHRAE) ASHRAE Standard 34-2013 “Designation and Safety Classification of Refrigerants”. ASHRAE published addenda b,
Proponent: Richard Lord, representing United Technologies (richard.lord@carrier.utc.com) requests Disapprove.

Commenter’s Reason: The original proposal as submitted recommended the adoption of a new A2L machine room ventilation requirement that was extracted from a preliminary advisory public review document released by ASHRAE 15 for comments. The ventilation requirements were based on work that United Technologies and Carrier did and were in the process of releasing in a technical paper. Further work has been done and the procedure is being modified to account for low charge systems where the proposed ventilation requirements are too high and excessive. This was premature and it is likely that the requirements will be modified further before final release.

The floor modification is technical not correct and should be rejected. It proposes that either the new ventilation of ASHRE 15 ventilation be allowed, but the current ventilation requirements in ASHRAE 15 have been shown to not be sufficient and unsafe. Although the proposal does address ventilation all the other changes that will be required to safely apply an A2L refrigerant have not been included. It was noted that these are being proposed to the UMC but these changes were not approved and a committee was formed to be addressing. Implementing just the ventilation without the other changes will not be safe and the complete package needs to be done. Some of these additional requirements need to still be developed and verified and in fact ASHRAE/AHRI/DOE have established a project with 5.2 million of funding that will verify the safety of the various final proposal during 2016 and 2017.

This proposal, although well intended to accelerate the process is premature and should be rejected until all the development work and verification is done and a correct and complete proposal can then be developed and reviewed.

Proponent: Jim Tidwell, Tidwell Code Consulting, representing Honeywell (jimtidwell@tccfire.com) requests Approve as Modified by Committee.

Commenter’s Reason: I am in support of the committee recommendation, and urge the membership to uphold the committee’s vote. Please refer to the reason statement submitted with the original proposal for comprehensive reasoning on the matter.

The committee approved this proposal with one small but very important amendment. The proposal provides an alternative compliance path for some refrigerants that have been developed in response to federal agencies’ efforts to phase down some older, environmentally harmful refrigerants. The change is needed in order to recognize the low flammability characteristics of these new refrigerants and to create a more fluid path to ASHRAE 15, which is the industry standard for these installations. ASHRAE 15 is currently under revision, and it’s unlikely that it will be published with updated information in time to be referenced in the 2018 ICC codes.

This code change will bring closer harmonization between the IFC and ASHRAE 15; if, for some reason, the committee’s recommendation is overturned, the current requirement for Class I, Division II electrical equipment will be the only option for ignition control. This is an unnecessary requirement when the refrigeration equipment rooms are equipped with refrigerant detectors and ventilated according to established air flow amounts. The ventilation rates in the submittal are based upon peer reviewed, published research conducted by experts in the field.

Disapproval of this code change will guarantee a significant conflict with ASHRAE 15 and create unnecessary confusion in the industry. The committee’s decision was the correct one and should be upheld by the membership. Please vote to uphold the committee.
2015 International Fire Code

Proposed Change as Submitted

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Daikin US (JBENGINEER@aol.com)

Add new text as follows:

606.17 Group A2L Refrigerants. Mechanical refrigeration systems using Group A2L refrigerants shall meet the requirements for Group A2 refrigerants except where used in high probability systems for comfort cooling.

Reason: ASHRAE 34 created a subclass identified as A2L to recognize refrigerants that have a lower burning velocity measurement. These refrigerants are considered safer than refrigerants that have a flammability classification of A2. The A2L optional subclass is assigned to a refrigerant when the burning velocity is less than, or equal to, 3.9 inches per second or 10 cm per second when tested at 73.4° F.

The current Mechanical Code limits the use of A2 refrigerants to 6.6 pounds for comfort cooling purposes. However, the Mechanical Code does not distinguish between A2 and A2L refrigerants.

This proposed change will allow the use of A2L refrigerants for comfort cooling in high probability systems, which are direct systems. These are the common systems used in residential and commercial applications. A2L refrigerants are currently being used for comfort cooling in many other countries, including Australia, New Zealand, Japan, and Indonesia, to name a few.

While the limitation in use was originally written for A2 and other refrigerants, it is inappropriate for A2L refrigerants. The subclass A2L is a much safer refrigerant than A2 refrigerants. The fire potential is significantly reduced. As such, A2L refrigerants should be permitted for high-probability systems used for human comfort.

In addition to a low burning velocity, A2L refrigerants used in residential systems typically use a quantity of refrigerant that never approaches the lower flammability limit. If the concentration of refrigerant stays below the lower flammability limit, there is no fire hazard at all associated with the refrigerant.

Cost Impact: Will not increase the cost of construction

The use of Group A2L refrigerants does not increase the cost of construction. A2L refrigerants are still an option for designers and installers to use.

Public Hearing Results

Committee Reason: The concept of addressing this allowance for A2L refrigerants was acceptable but more work is necessary on the format of the language. Also, correlation is needed with code change proposal F93-16.

Individual Consideration Agenda

Proponent: Julius Ballanco, representing Daikin US (JBENGINEER@aol.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

606.17 Group A2L Refrigerants Listed Systems. Mechanical refrigeration systems using Group A2L refrigerants shall meet the requirements for Group A2 refrigerants except where used in high probability systems for comfort cooling. The maximum amount of A2L refrigerant for listed systems used for comfort cooling shall be based on the amount of refrigerant per occupied space in accordance with the International Mechanical Code.
**Commenter's Reason:** The initial language proposed was not clear in identifying the acceptance of new A2L refrigerants for comfort cooling. This modification meets the intent of the Committee's comment regarding the need to clarify the allowable maximum use of A2L refrigerant. This proposed modification is consistent with the changes that are being finalized to ASHRAE 15. It is necessary to include this requirement since A2L refrigerants are being used for comfort cooling in direct systems. These systems are listed by a third party agency. The Mechanical Code requires the systems to be installed in accordance with the manufacturer's installation instructions.

The International Mechanical Code already lists a number of A2L refrigerants in Table 1103.1. This table is used to determine the maximum use of the refrigerant based on the volume of the area being cooled. This calculated value would be the upper limit for the use of A2L refrigerants.

The newer category of A2L refrigerants are low global warming potential refrigerants that will replace the currently used refrigerants in comfort cooling systems. The predominant refrigerant used today is R410a. It is anticipated that this refrigerant will be removed from the market in the next 7 years. The code needs to be updated with the newer refrigerants to allow for the smooth transition of comfort cooling systems that utilize low global warming potential refrigerants.

**Proponent:** Richard Lord, representing United Technologies (richard.lord@carrier.utc.com) requests Disapprove.

**Commenter's Reason:** I understand this proposal as disapproved but the overall initial proposal was trying to propose that for some high probability systems that an A2L refrigerant can be safely applied as an A1 refrigerant with no special modification or mitigation. We have done considerable work in this area with CFD modeling, testing and risk evaluations and this is not a safe approach. We do believe that A2L refrigerants can be safely applied by there is additional changes that need to be made to the units, qualification, and application of the equipment in the field which are being developed in standards like the IEC60335-2-40 and the new ASHRAE 15.2. But these standards are not ready for release and work is still underway to develop the requirements, verify the by tests and models. Also critical to this is the development of new training procedures and service practices.

If this is resubmitted it should be disapproved as the final requirements for mitigation and application will not be completed and verified by testing that is planned by ASHRAE/AHRIDOE funded projects.

If the proposal is to allow application fo A2L as A2 this will essential be of no use for the high probability systems and is not worth the effort.
Proponent: Michael O'Brian representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code

Add new text as follows:

105.6.44 Stationary storage battery systems, A permit is required for the operation of a stationary storage battery system regulated by Section 608.

Revise as follows:

SECTION 202 DEFINITIONS

BATTERY TYPES.

Lithium-ion Flow battery. A type of storage battery that consists which includes chemical components dissolved in two different liquids. Ion exchange, which provides the flow of lithium ions embedded through the membrane while both liquids circulate in a carbon graphite or nickel metal-oxide substrate their own respective space. The electrolyte is a carbonate mixture or a gelled polymer. The lithium ions are the charge carriers of the battery.

Lithium metal polymer Lead acid battery. A storage battery that is comprised of nonaqueous lead electrodes immersed in sulphuric acid electrolyte.

Lithium-ion battery. A storage battery with lithium ions serving as the charge carriers of the battery. The electrolyte is a polymer mixture of carbonates with an inorganic salt and can be in a liquid or a gelled polymer from. Lithiated metal oxide is typically a cathode and forms of carbon or polymerized electrolytes, which provide ionic conductivity between lithiated positive active material electrically separated from metallic graphite typically form the anode.

Lithium metal polymer battery. A storage battery that is similar to the lithium ion battery except that it has a lithium metal anode in the place of the traditional carbon or lithiated negative active material graphite anode.

Nickel cadmium (Ni-Cd) battery. An alkaline storage battery in which the positive active material is nickel oxide, the negative contains cadmium and the electrolyte is potassium hydroxide.

Nonrecombinant Pre-engineered stationary storage battery system. An energy storage system consisting of batteries, a battery management system, components and modules that are produced in a factory, designed to comprise the system when assembled and shipped to the job site for assembly.

Prepackaged stationary storage battery system. An energy storage system consisting of batteries, a battery management system, components and modules that is factory assembled and shipped as a complete unit for installation at the job site.

Sodium-beta storage battery. A storage battery also referred to as Na-beta batteries or NBBs which, under conditions of normal use, hydrogen uses a solid beta-alumina electrolyte membrane that selectively allows sodium ion transport between a positive electrode such as metal halide and oxygen gasses created by electrolysis are vented into the air outside of the battery a negative sodium electrode.

Recombinant battery. A storage battery in which, under conditions of normal use, hydrogen and oxygen gases created by electrolysis are converted back into water inside the battery instead of venting into the air outside of the battery.

Stationary storage battery. A group of electrochemical cells interconnected to supply a nominal voltage of DC power to a suitably connected electrical load, designed for service in a permanent location. The number of cells connected in a series determines the nominal voltage rating of the battery. The size of the cells determines the discharge capacity of the entire battery. After discharge, it may be restored to a fully charged condition by an electric current flowing in a direction opposite to the flow of current when the battery is discharged.

Valve-regulated lead acid (VRLA) battery. A lead acid battery consisting of sealed cells furnished with a valve that
opens to vent the battery whenever the internal pressure of the battery exceeds the ambient pressure by a set amount. In VRLA batteries, the liquid electrolyte in the cells is immobilized in an absorptive glass mat (AGM cells or batteries) or by the addition of a gelling agent (gel cells or gelled batteries).

**Vented (flooded) lead-acid battery.** A lead-acid battery consisting of cells that have electrodes immersed in liquid electrolyte. Flooded lead-acid batteries have a provision for the user to add water to the cell and are equipped with a flame-arresting vent which permits the escape of hydrogen and oxygen gas from the cell in a diffused manner such that a spark, or other ignition source, outside the cell will not ignite the gases inside the cell.

Delete without substitution:

**202 BATTERY SYSTEM, STATIONARY LEAD ACID.** A system which consists of three interconnected subsystems:

1. A lead-acid battery.
2. A battery charger.
3. A collection of rectifiers, inverters, converters and associated electrical equipment as required for a particular application.

Add new definition as follows:

**BATTERY SYSTEM, STATIONARY STORAGE.** A rechargeable energy storage system consisting of electrochemical storage batteries, battery chargers, controls, and associated electrical equipment designed to provide electrical power to a building. The system is typically used to provide standby or emergency power, an uninterruptable power supply, load shedding, load sharing or similar capabilities.

**ENERGY MANAGEMENT SYSTEM.** An electronic system protects stationary storage batteries from operating outside its safe operating parameters, and generates alarm and trouble for off normal conditions.

- **STATIONARY BATTERY ARRAY –** An arrangement of individual stationary storage batteries in close proximity to each other, mounted on storage racks or in modules, battery cabinets or other enclosures.

Revise as follows:

[A] 105.7.2 Battery systems. A construction permit is required to install stationary storage battery systems having a liquid capacity of more than 50 gallons (189 L) regulated by Section 608.

**602.1 Definitions.** The following terms are defined in Chapter 2:

- **BATTERY SYSTEM, STATIONARY LEAD-ACID STORAGE.**
- **BATTERY TYPES.**
- **COMMERCIAL COOKING APPLIANCES.**
- **CRITICAL CIRCUIT.**
- **EMERGENCY POWER SYSTEM.**
- **HOOD.**
- **Type I.**
- **Type II.**
- **REFRIGERANT.**
- **REFRIGERATION SYSTEM.**
- **STANDBY POWER SYSTEM.**

**SECTION 608 STATIONARY STORAGE BATTERY SYSTEMS**

Note: The existing Sectin 608.1 through 608.9 are to be deleted.

Delete and substitute as follows:

**608.1 Scope.** Stationary storage battery systems having an electrolyte capacity of more than 50 gallons (189 L) for flooded lead acid, nickel cadmium (Ni-Cd) and valve regulated lead acid (VRLA), or more than 1,000 pounds (454 kg) for lithium ion and lithium metal polymer, used for facility standby power, emergency power or uninterruptible power supplies shall comply with this section and Table 608.1.

Stationary storage battery systems having capacities exceeding the values shown in Table 608.1 shall comply with Section 608.1.2 through 608.6.6, as applicable.

<table>
<thead>
<tr>
<th>BATTERY TECHNOLOGY</th>
<th>CAPACITY</th>
</tr>
</thead>
</table>

**TABLE 608.1**

**BATTERY STORAGE SYSTEM THRESHOLD QUANTITIES.**


<table>
<thead>
<tr>
<th>Battery Technology</th>
<th>KWh (Megajoules)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead acid, all types</td>
<td>70 (252)</td>
</tr>
<tr>
<td>Nickel cadmium (Ni-Cd)</td>
<td>70 (252)</td>
</tr>
<tr>
<td>Lithium, all types</td>
<td>20 (72)</td>
</tr>
<tr>
<td>Sodium, all types</td>
<td>20 (72)</td>
</tr>
<tr>
<td>Flow batteries</td>
<td>20 (72)</td>
</tr>
<tr>
<td>Other battery technologies</td>
<td>10 (36)</td>
</tr>
</tbody>
</table>

a. For batteries rated in Amp-Hours, KWh shall equal rated voltage times amp-hour rating divided by 1000
b. Shall include vanadium, zinc-bromine, polysulfide-bromide, and other flowing electrolyte type technologies
c. 70 KWh (252 Mega joules) for sodium-ion technologies

608.1.1 Permits. Permits shall be obtained for the installation and operation of stationary storage battery systems in accordance with Sections 105.6.44 and 105.7.2.

608.1.2 Construction documents. The following information shall be provided with the permit application:

1. Location and layout diagram of the room in which the stationary storage battery system is to be installed
2. Details on hourly fire-resistant rated assemblies provided
3. Quantities and types of storage batteries and battery systems
4. Manufacturer's specifications, ratings and listings of storage batteries and battery systems
5. Details on energy management systems
6. Location and content of signage
7. Details on fire suppression, smoke detection and ventilation systems.
8. Rack storage arrangement, including seismic support criteria.

608.1.3 Hazard mitigation analysis. A failure modes and effects analysis (FMEA) or other approved hazard mitigation analysis shall be provided in accordance with Section 104.7.2 under any of the following conditions:

1. Battery technologies not specifically identified in Table 608.1 are provided.
2. More than one stationary storage battery technology is provided in a room or indoor area where there is a potential for adverse interaction between technologies.
3. When allowed as a basis for increasing maximum allowable quantities. See 608.3.

608.1.3.1 Fault condition. The hazard mitigation analysis shall evaluate the consequences of the following failure modes, and others deemed necessary by the fire code official. Only single failure modes shall be considered.

1. Thermal runaway condition in a single battery storage rack, module or array.
2. Failure of any energy management system.
3. Failure of any required ventilation system.
4. Voltage surges on the primary electric supply.
5. Short circuits on the load side of the stationary battery storage system.
6. Failure of the smoke detection, fire suppression, or gas detection system.
7. Spill neutralization not being provided or failure of the secondary containment system.

608.1.3.2 Analysis approval. The fire code official is authorized to approve the hazardous mitigation analysis provided the consequences of the hazard mitigation analysis demonstrate:

1. Fires or explosions will be contained within unoccupied battery storage rooms for the minimum duration of the fire resistance rated walls identified in IBC table 509.1.
2. Fires and explosions in battery cabinets in occupied work centers will be detected in time to allow occupants within the room to safely evacuate.
3. Toxic and highly toxic gases released during fires and other fault conditions shall not reach concentrations in access of IDLH level in the building or adjacent means of egress routes during the time deemed necessary to evacuate from that area.
4. Flammable gases released from batteries during charging, discharging and normal operation shall not exceed 25% of their lower flammability limit (LFL).
5. Flammable gases released from batteries during fire, overcharging and other abnormal conditions shall not create an explosion hazard that will injure occupants or emergency responders.

608.1.3.3 Additional protection measures. Construction, equipment and systems that are required for the stationary storage battery system to comply with the hazardous mitigation analysis, including but not limited to those specifically described...
in Section 608.1, shall be installed, maintained and tested in accordance with nationally recognized standards and specified design parameters.

608.1.4 Seismic and structural design. Storage battery systems shall comply with the seismic design requirements in Chapter 16 of the International Building Code, and shall not exceed the floor loading limitation of the building.

608.1.5 Vehicle impact protection. Where stationary storage battery systems are subject to impact by a motor vehicle, including fork lifts, vehicle impact protection shall be provided in accordance with Section 312.

608.1.6 Combustible storage. Combustible materials not related to the stationary storage battery system shall not be stored in battery rooms, cabinets or enclosures. Combustible materials in occupied work centers covered by Section 608.2.5 shall not be stored less than 3 feet (915 mm) from battery cabinets.

608.1.6 Combustible storage. Combustible materials not related to the stationary storage battery system shall not be stored in battery rooms, cabinets or enclosures. Combustible materials in occupied work centers covered by Section 608.2.5 shall not be stored less than 3 feet (915 mm) from battery cabinets.

608.1.7 Testing, maintenance and repairs. Storage batteries and associated equipment and systems shall be tested and maintained in accordance with the manufacturer's instructions. Any storage batteries or system components used to replace existing units shall be compatible with the battery charger, energy management systems, other storage batteries, and other safety systems. Introducing other types of storage batteries into the stationary storage battery system, or other types of electrolytes into flow battery systems shall be treated as a new installation and require approval by the fire code official before the replacements are introduced into service.

608.2 Location and construction. Rooms and areas containing stationary storage battery systems shall be designed, located and constructed in accordance with this section.

608.2.1 Location. Stationary storage battery systems shall not be located in areas where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, or where the floor level is more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge.

Exception: Installations on noncombustible rooftops of buildings exceeding 75 feet (22 860 mm) in height that do not obstruct fire department rooftop operations shall be permitted where approved by the fire code official.

608.2.2 Separation. Rooms containing stationary storage battery systems shall be separated from other areas of the building in accordance with Section 509.1 of the International Building Code. Battery systems shall be allowed to be in the same room with the equipment they support.

608.2.3 Stationary battery arrays. Storage batteries, prepackaged stationary storage battery systems and pre-engineered stationary storage battery systems shall be segregated into stationary battery arrays not exceeding 50 KWh (180 Mega joules) each. Each stationary battery array shall be spaced a minimum three feet (914 mm) from other stationary battery arrays and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exceptions:

1. Lead acid storage battery arrays shall not exceed 250 KWh (900 Mega joules) each.
2. Listed pre-engineered stationary storage battery systems and prepackaged stationary storage battery systems shall not exceed 150 KWh (540 Mega joules) each.

608.2.4 Separate rooms. Where stationary batteries are installed in a separate equipment room accessible only to authorized personnel, they shall be permitted to be installed on an open rack for ease of maintenance.

608.2.5 Occupied work centers. Where stationary storage batteries are located in an occupied work center, they shall be housed in a noncombustible cabinet or other enclosure to prevent access by unauthorized personnel.

608.2.5.1 Cabinets. Where stationary batteries are contained in cabinets in occupied work centers, the cabinet enclosures shall be located within 10 feet (3048 mm) of the equipment that they support.

608.2.6 Signage. Approved signs shall be provided on doors or in locations near entrances to stationary storage battery system rooms and shall include the following or equivalent.

1. A minimum 8 in. (200 mm) wide and 6 in. (150 mm) high sign with: CAUTION, WARNING or DANGER
   1.1 BATTERY ROOM, 1.2 AUTHORIZED PERSONNEL ONLY, and 1.3 The additional markings required in Section 608.6 for the types of storage batteries contained within the room.

Exception: AUTHORIZED PERSONNEL ONLY markings are not required for entrances to occupied work centers complying
with Section 608.2.5.

1. Hazard identification markings in accordance with NFPA 704.

608.2.6.1 Electrical disconnects. Where the stationary storage battery system disconnecting means is not within sight of the main service disconnecting means, placards or directories shall be installed at the location of the main service disconnecting means indicating the location of stationary storage battery system disconnecting means in accordance with NFPA 70.

608.2.6.2 Cabinet signage. Battery storage cabinets provided in occupied work centers in accordance with Section 608.2.5 shall have exterior labels that indicate CAUTION, BATTERY STORAGE CABINET, AUTHORIZED PERSONNEL ONLY, and the additional markings required in Section 608.6 for the types of storage batteries contained within the cabinet.

608.2.7 Outdoor installations. Stationary storage battery systems located outdoors shall comply with this Section, in addition to all applicable requirements of Section 608. Installations in outdoor enclosures or containers which can be occupied for servicing, testing, maintenance and other functions shall be treated as battery storage rooms.

Exception: Stationary battery arrays in noncombustible containers shall not be required to be spaced three feet (914 mm) from the container walls.

608.2.7.1 Separation. Stationary storage battery systems located outdoors shall be separated by a minimum five feet (1524 mm) from the following:

1. Lot lines
2. Public ways
3. Buildings
4. Stored combustible materials
5. Hazardous materials
6. High-piled stock
7. Other exposure hazards

608.2.7.2 Means of egress. Stationary storage battery systems located outdoors shall be separated from any means of egress as required by the fire code official to ensure safe egress under fire conditions, but in no case less than 10 feet (3048 mm).

608.2.7.3 Security of outdoor areas. Outdoor areas in which stationary storage battery systems are located shall be secured against unauthorized entry and safeguarded in an approved manner.

608.2.7.4 Walk-in units. Where a stationary storage battery system includes an outer enclosure, the unit shall only be entered for inspection, maintenance and repair of batteries and electronics, and shall not be occupied for other purposes.

608.3 Maximum allowable quantities. Fire areas within buildings containing stationary storage batteries systems exceeding the maximum allowable quantities in Table 608.3 shall comply with all applicable High Hazard Group H occupancy requirements in this code and the International Building Code.

Exception: Where approved by the fire code official, areas containing stationary storage batteries that exceed the amounts in Table 608.3 shall be permitted to be treated as incidental use areas and not Group H occupancies based on a hazardous mitigation analysis in accordance with 608.1.3 and large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory.

<table>
<thead>
<tr>
<th>BATTERY TECHNOLOGY</th>
<th>MAXIMUM ALLOWABLE QUANTITIES (KWh)</th>
<th>GROUP H OCCUPANCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead acid, all types</td>
<td>600</td>
<td>Group H-4</td>
</tr>
<tr>
<td>Nickel cadmium (Ni-Cd)</td>
<td>600</td>
<td>Group H-4</td>
</tr>
<tr>
<td>Lithium, all types</td>
<td>600</td>
<td>Group H-2</td>
</tr>
<tr>
<td>Sodium, all types</td>
<td>600</td>
<td>Group H-2</td>
</tr>
<tr>
<td>Flow batteries</td>
<td>600</td>
<td>Group H-2</td>
</tr>
<tr>
<td>Other battery technologies</td>
<td>200</td>
<td>Group H-2</td>
</tr>
</tbody>
</table>

a. For batteries rated in Amp-Hours, Watt-hours (Wh) shall equal rated battery voltage times the Amp-hour rating divided by 1000.
b. Shall include vanadium, zinc-bromine, polysulfide-bromide, and other flowing electrolyte type technologies

c. Shall be a Group H-4 occupancy if the fire code official determines that a fire or thermal runaway involving the battery technology does not represent a significant fire hazard

608.3.1 Mixed battery systems. Where areas within buildings contain different types of storage battery technologies, the total aggregate quantities of batteries shall be determined based on the sum of percentages of each battery type quantity divided by the maximum allowable quantity of each battery type. If the sum of the percentages exceeds 100%, the area shall be treated as a high-hazard Group H occupancy in accordance with Table 608.3.

608.4 Storage batteries and equipment. The design and installation of storage batteries and related equipment shall comply with this sections 608.4.1 through 608.4.8.

608.4.1 Listings. Storage batteries and battery storage systems shall comply with all of the following:

1. Storage batteries shall be listed in accordance with UL 1973.
2. Prepackaged and pre-engineered stationary storage battery systems shall be listed in accordance with UL 9540.

Exception: Lead-acid batteries are not required to be listed.

608.4.2 Prepackaged and pre-engineered systems. Prepackaged and pre-engineered stationary storage battery systems shall be installed in accordance with their listing and the manufacturer's instructions.

608.4.3 Energy management system. An approved energy management system shall be provided for monitoring and balancing cell voltages, currents and temperatures within the manufacturer's specifications. The system shall transmit an alarm signal to an approved location if potentially hazardous temperatures or other conditions such as short circuits, overvoltage (overcharge) or under voltage (over discharge) are detected.

608.4.4 Battery chargers. Battery chargers shall be compatible with the battery chemistry and the manufacturer's electrical ratings and charging specifications. Battery chargers shall be listed and labeled in accordance with the UL 1564 or provided as part of a listed pre-engineered or prepackaged stationary storage battery system.

608.4.5 Inverters. Inverters shall be listed and labeled in accordance with UL 1741. Only inverters listed and labeled for utility interactive system use and identified as interactive shall be allowed to operate in parallel with the electric utility power system to supply power to common loads.

608.4.6 Safety caps. Vented batteries shall be provided with flame-arresting safety caps.

608.4.7 Thermal runaway. Where required by Section 608.6 storage batteries shall be provided with a listed device or other approved method to prevent, detect and control thermal runaway.

608.4.8 Toxic and highly toxic gas. Stationary storage battery systems that have the potential to release toxic and highly toxic materials during charging, discharging and normal use conditions shall comply with Chapter 60.

608.5 Suppression and detection systems. Suppression and detection systems shall be provided in accordance with Sections 608.5.1 through 608.5.5.

608.5.1 Fire suppression systems. Rooms containing stationary storage battery systems shall be equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1. Commodity classifications for specific technologies of storage batteries shall be in accordance with Chapter 5 of NFPA 13. If the storage battery types are not addressed in Chapter 5 of NFPA 13, the fire code official is authorized to approve the fire suppression system based on full scale fire and fault condition testing conducted or witnessed and reported by an approved laboratory.

608.5.1.1 Alternative suppression systems. Battery systems that utilize water reactive materials shall be protected by an approved alternative automatic fire extinguishing system in accordance with Section 904. The system shall be listed for protecting the type, arrangement and quantities of storage batteries in the room. The fire code official shall be permitted to approve the alternate fire suppression system based on full scale fire and fault condition testing conducted or witnessed and reported by an approved laboratory.

608.5.2 Smoke detection system. An approved automatic smoke detection system shall be installed in rooms containing stationary storage battery systems in accordance with Section 907.2.

608.5.3 Mechanical ventilation. Where required by Section 608.6 or Section 608.1.4.3, ventilation of rooms containing stationary storage battery systems shall be provided in accordance with the International Mechanical Code and the following:

1. The ventilation system shall operate continuously or be designed to operate upon activation of the gas detection system.
2. The system shall provide ventilation at a rate of not less than 1 cubic foot per minute (cfm) per square foot (0.00508 m³/(s • m²)) of floor area, but not less than 150 cfm (4 m³/min).
3. The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor density greater than air and across all parts of the vault ceiling for gases having a vapor density less than air.

608.5.3.1 Cabinet ventilation. Where cabinets located in occupied spaces contain the storage batteries that are required by Section 608.6 or 608.1.4.3 to be provided with ventilation, the cabinet shall be provided with mechanical ventilation in accordance with Section 608.5.3.

608.5.3.2 Supervision. Required mechanical ventilation systems for rooms and cabinets containing storage batteries shall be supervised by an approved central station, proprietary or remote station service or shall initiate an audible and visual signal at an approved constantly attended on-site location.

608.5.4 Gas detection system. Where required by Section 608.6 or 608.1.4.3, rooms containing stationary storage battery systems shall be protected by a continuous gas detection system. The gas detection system shall be designed to activate where the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL), or where the level of toxic or highly toxic gases exceeds the permissible exposure limits (PEL).

608.5.4.1 System activation. Activation of the gas detection system shall result in all the following:

1. Initiation of distinct audible and visible alarms in the battery storage room.
2. Transmission of an alarm to an approved location.
3. De-energizing of the battery charger.
4. Activation of the mechanical ventilation system, where the system is interlocked with the gas detection system.

608.5.5 Spill control and neutralization. Where required by Section 608.6, approved methods and materials shall be provided for the control and neutralization of spills of electrolyte or other hazardous materials in areas containing stationary storage batteries containing free electrolyte as follows:

1. Spill control for battery systems containing more than 55 gallons (208 L) of electrolytes or other hazardous materials shall be provided in accordance with section 5004.2.1.
2. Neutralization materials or methods shall be provided that are capable of neutralizing a spill of the total capacity from the largest battery array or equipment to a pH between 5.0 and 9.0.

608.6 Specific battery type requirements. This section includes requirements applicable to specific types of storage batteries. Stationary storage battery systems with more than one type of storage battery shall comply with requirements applicable to each battery type.

608.6.1 Lead acid storage batteries. Stationary battery systems utilizing lead acid storage batteries shall comply with the following:

1. Mechanical ventilation shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. Thermal runaway protection shall be provided for VRLA storage batteries in accordance with Section 608.4.7.
4. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.1 shall be provided:

![FIGURE 608.6.1 LEAD ACID STORAGE BATTERY SIGNAGE](image)

608.6.2 Nickel cadmium (Ni-Cd) storage batteries. Stationary battery systems utilizing nickel cadmium (Ni-Cd) storage batteries shall comply with the following:

1. Mechanical ventilation shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. Thermal runaway protection shall be provided for valve regulated sealed nickel cadmium storage batteries in accordance with Section 608.4.7.
4. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.2 shall be provided.

![FIGURE 608.6.2 NICKEL CADMIUM (NI-CD) BATTERY SIGNAGE](image1)

CAUTION — Corrosive Liquids

This room contains nickel cadmium batteries and energized electrical circuits. Hydrogen gas may be present.

608.6.3 Lithium-ion storage batteries. Stationary battery systems utilizing lithium-ion storage batteries shall provide signage in accordance with Section 608.2 and the text in Figure 608.6.3.

![FIGURE 608.6.3 LITHIUM-ION BATTERY SIGNAGE](image2)

CAUTION

This room contains lithium-ion batteries and energized electrical circuits.

608.6.4 Sodium beta storage batteries. Stationary battery systems utilizing sodium beta storage batteries shall comply with the following:

1. Mechanical ventilation shall be provided in accordance with Section 608.5.3.
2. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.4 shall be provided.

![FIGURE 608.6.4 SODIUM BETA BATTERY SIGNAGE](image3)

CAUTION — Water Reactive Hazards

This room contains sodium beta batteries and energized electrical circuits.

APPLY NO WATER

608.6.5 Flow storage batteries. Stationary battery systems utilizing flow storage batteries shall comply with the following:

1. Mechanical ventilation shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. In addition to the signage required in Section 608.2.6, the following text in Figure 608.6.5 shall be provided:

![FIGURE 608.6.5 FLOW BATTERY SIGNAGE](image4)
608.6.6 Other battery technologies. Stationary battery systems utilizing battery technologies other than those described in Sections 608.6.1 through 608.6.5 shall comply with the following:

1. Continuous flammable gas detection systems shall be provided in accordance with Section 608.5.4 where the batteries have the potential to produce toxic or highly toxic gases in the storage room or cabinet in excess of the permissible exposure limits (PEL) during charging, discharging and normal system operation.

2. Mechanical ventilation shall be provided in accordance with Section 608.5.3.

3. Spill control and neutralization shall be in accordance with Section 608.5.5.

4. In addition to the signage required in Section 608.2.6, the marking shall identify the type of batteries present, describe the potential hazards associated with the battery type, and indicate the room contains energized electrical circuits.

Revise as follows:

907.2.23 Battery rooms. An automatic smoke detection system shall be installed in areas containing stationary storage battery systems with a liquid capacity of more than 50 gallons (189 L) as required in Section 608.

2015 International Building Code

Revise as follows:

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles hazardous materials as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the International Fire Code.

2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the International Fire Code.

3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.

4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour fire barriers constructed in accordance with Section 707 or 1-hour horizontal assemblies constructed in accordance with Section 711, or both.

5. Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).


7. Refrigeration systems.

8. The storage or utilization of materials for agricultural purposes on the premises.

9. Stationary batteries utilized for facility emergency power, uninterruptable power supply or telecommunication facilities, provided that the batteries are provided with safety venting caps and ventilation is provided in accordance with the International Mechanical Code.

9. Stationary storage battery systems installed in accordance with the International Fire Code.

10. Corrosive personal or household products in their original packaging used in retail display.

11. Commonly used corrosive building materials.

12. Buildings and structures occupied for aerosol storage shall be classified as Group S-1, provided that such buildings conform to the requirements of the International Fire Code.

13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per control area in Group M or S occupancies complying with Section 414.2.5.

14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the International Fire Code.

TABLE 509

<table>
<thead>
<tr>
<th>INCIDENTAL USES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROOM OR AREA</td>
</tr>
<tr>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Furnace room where any piece of equipment is over 400,000 Btu per hour input</td>
</tr>
<tr>
<td>Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower</td>
</tr>
<tr>
<td>Refrigerant machinery room</td>
</tr>
<tr>
<td>Hydrogen fuel gas rooms, not classified as Group H</td>
</tr>
<tr>
<td>Incinerator rooms</td>
</tr>
<tr>
<td>Paint shops, not classified as Group H, located in occupancies other than Group F</td>
</tr>
<tr>
<td>In Group E occupancies, laboratories and vocational shops not classified as Group H</td>
</tr>
<tr>
<td>In Group I-2 occupancies, laboratories not classified as Group H</td>
</tr>
<tr>
<td>In ambulatory care facilities, laboratories not classified as Group H</td>
</tr>
<tr>
<td>Laundry rooms over 100 square feet</td>
</tr>
<tr>
<td>In Group I-2, laundry rooms over 100 square feet</td>
</tr>
<tr>
<td>Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces</td>
</tr>
<tr>
<td>In Group I-2, physical plant maintenance shops</td>
</tr>
<tr>
<td>In ambulatory care facilities or Group I-2 occupancies, waste and linen collection rooms with an aggregate volume of 10 cubic feet or greater</td>
</tr>
<tr>
<td>In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet</td>
</tr>
<tr>
<td>In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than 100 square feet</td>
</tr>
<tr>
<td>Stationary storage battery systems having an energy liquid electrolyte capacity greater than the threshold quantity specified in Table 608.1 of the International Fire Code, of more than 50 gallons for flooded lead acid, nickel cadmium or VRLA, or more than 1,000 pounds for lithium-ion and lithium metal polymer used for facility standby power, emergency power or uninterruptible power supplies</td>
</tr>
</tbody>
</table>

For SI: 1 square foot = 0.0929 m², 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L, 1 cubic foot = 0.0283 m³.

Reference standards type: This reference standard is new to the ICC Code Books

Add new standard(s) as follows:

UL 1564 Standard for Industrial Battery Chargers.
UL 1973 Standard for Batteries for Use in Light Electric Rail (LER) Applications and Stationary Applications
UL 9540 Standard for Energy Storage Systems and Equipment

Reason: When Section 608 was developed it primarily addressed hazards associated with stationary lead acid battery systems used for standby and emergency power. Advancements in battery technologies have introduced a new generation of battery technologies, such as lithium-ion and flow batteries, each with advantages and potential hazards. Unfortunately the IFC/IBC have no specific requirements that regulate the use of these new battery technologies in occupancies and buildings, including high-rise and underground buildings. At the same time societal needs for energy solutions such as load shedding and load sharing, while well intentioned, have created a situation where thousands of pounds of storage batteries, and millions was watt-hours of stored energy systems can be installed with little if any building or fire official oversight.

Providing protection for these new technologies and the huge amounts of energy they store is something that needs to be addressed through research, fire and fault condition testing, and the development of effective safety standards. Unfortunately much of this working, such as determining the ability of fire suppression systems to control thermal runaway of a large storage battery installation, still needs to be completed.
This proposal provides a complete rewrite of Section 608 and is an integral part of an energy storage system (ESS) set of IFC proposals. This proposal was developed with input from a Fire Code Action Committee Energy Storage System working group, which consisted of industry, representatives of government agencies, and the fire service. Comments on selected portions of the proposal:

105.7.2, 608.1.2, 608.1.3  A construction permit was added, along with details on the documentation needed to evaluate the construction.

Section 202  Definitions of two terms used in this Section were added for clarification.

608.1.1, Table 608.1  The scope of this section was revised to (1) add new battery technologies, (2) use Kilowatt-hour units which better describe the risk level (and use) compared to gallons of electrolyte or pounds of batteries, (3) establish threshold levels that are commensurate with the potential risks. The 70 KWh should approximate the existing 50 gallon electrolyte trigger for lead-acid batteries.

608.1.4 – 608.1.4.3  A hazardous mitigation analysis is required under certain identified circumstances to address uncertainties associated with new technologies and configurations. This section describes the fault considerations to be evaluated and the acceptance criteria to be achieved, information needed by both the design professional and the fire code official.

608.2.1  These location restrictions address concerns fire departments have with responding to incidents involving stationary storage battery systems, which include upper stories in high rise buildings and in stories identified as underground buildings.

608.2.2  Retains the hourly incidental use fire-resistance separation requirements in IBC Table 509.1.

608.2.3  To address unknowns on whether thermal runaways can proliferate unabated through a very large number of adjacent batteries in a storage room, a maximum 50 KWh limitation was proposed for individual arrays, or groups of adjacent batteries, which are required to be separated by three feet from other battery arrays or walls. To put this in perspective this 50 KWh is equivalent to 104 storage batteries, each rated 12V, 40 A-H. Exceptions for larger size arrays are provided for lead-acid batteries based on their track record over the years, and for listed pre-engineered and prepackaged storage battery systems.

608.2.4, 608.2.5  Sections based on current IFC requirements.

608.2.6  New signage requirements, which provide important information for facility personnel and emergency responders.

608.2.7  New requirements for outdoor installations that recognize installations are being provided in ISO and similar metal and noncombustible containers. An exception for not requiring 3 foot spacing from stationary battery arrays to the noncombustible walls recognizes that the container is not directly adjacent to an occupied portion of the building.

608.3  Scientific research and large scale fire and fault condition testing is not available to justify allowing unlimited quantities of storage batteries to be provided in mixed occupancy buildings using the incidental use provisions of the code. This section establishes a maximum 600 KWh MAQ for each fire area, which is equivalent to 1250 storage batteries, each rated 12V, 40 A-H. Quantities above this amount are only allowed in Group H occupancies. An exception is provided for allowing larger quantities, when approved, based on large scale testing.

608.4  This section includes requirements that the storage batteries and related equipment must meet. This includes listing of the batteries and battery systems, which will address construction and safety performance requirements. Energy management systems are an important element of a safe system that monitor and take actions on off normal conditions that could lead to problems.

608.4.8  This section covers battery technologies (many yet to hit the market) that produce toxic gases during charging, discharging and normal use, and triggers Chapter 60 safety requirements. There is no intent to address batteries that produce toxic gases during fires or abnormal conditions.

608.5.1  A significant challenge facing designers and code officials is a lack of large scale fire and fault condition test data that demonstrates that fire suppression systems can control battery fires. Until such protection arrangements are documented in NFPA 13 and other standards, this section allows the code official to approve suppression systems based on test data made available to him.

608.5.2  Existing requirement.

608.5.3  Mechanical ventilation requirements are consistent with existing IFC battery room and battery cabinet requirements. However in lieu of continuous ventilation they are allowed, ventilation is permitted to be provided upon activation of the gas detection system.

608.5.4  Gas detection systems must be provided if so required by the approved hazard mitigation analysis (Section 608.1.4.3) or by Section 608.6. They may also be provided to activate mechanical ventilation systems.

608.5.5  Spill control and neutralization requirements are based on existing stationary battery system requirements, and also applicable requirements for spill control for hazardous material liquids, included in Section 5004.2.1. This recognizes that in new battery technologies that spills of hazardous materials other than lead acid electrolyte might occur and need to be mitigated.
608.6 This section includes requirements for specific battery technologies, and includes criteria that address potential hazards associated with the type of technology involved. The protection requirements are customized for the potential hazards associated with the various battery technologies.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Cost Impact: Will increase the cost of construction
This proposal introduces a number of new requirements that cover stationary storage battery installations that were previously largely unregulated.

608.6 The section includes requirements for specific battery technologies, and includes criteria that address potential hazards associated with the type of technology involved. The protection requirements are customized for the potential hazards associated with the various battery technologies.

Modification:

105.6.44 Stationary storage battery systems. A permit is required for the operation of a stationary storage battery system regulated by Section 608.

608.1.1 Permits. Permits shall be obtained for the installation and operation of stationary storage battery systems in accordance with Sections 105.6.44 and Section 105.7.2.

608.2.1 Location. Stationary storage battery systems shall not be located in areas where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, or where the floor level is more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge.

Exception Exceptions:
1. Lead acid and nickel cadmium stationary storage battery systems.
2. Installations on noncombustible rooftops of buildings exceeding 75 feet (22 860 mm) in height that do not obstruct fire department rooftop operations shall be permitted where approved by the fire code official.

608.2.3 Stationary battery arrays. Storage batteries, prepackaged stationary storage battery systems and pre-engineered stationary storage battery systems shall be segregated into stationary battery arrays not exceeding 50 KWh (180 Mega joules) each. Each stationary battery array shall be spaced a minimum three feet (914 mm) from other stationary battery arrays and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exceptions:
1. Lead acid and nickel cadmium storage battery arrays shall not exceed 250 KWh (900 Mega joules) each.
2. Listed pre-engineered lithium ion battery arrays shall not exceed 250 (900 Mega joules) each.
3. Listed pre-engineered stationary storage battery systems and prepackaged stationary storage battery systems shall not exceed 150 KWh (540 Mega joules) each.
4. The fire code official is authorized to approve listed pre-engineered and prepackaged battery arrays with larger capacities or smaller battery array spacing if large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving one array will not propagate to an adjacent array, and be contained within the room for a duration equal to the fire resistance rating of the room separation specified in Table 509 of the International Building Code.

608.2.6 Signage Approved signs shall be provided on doors or in locations near entrances to stationary storage battery system rooms and shall include the following or equivalent.
0.1. The room contains energized battery systems.
0.1. The room contains energized electrical circuits.
0.1. AUTHORIZED PERSONNEL ONLY, if required by Section 608.4.
0.1. The additional markings required in Section 608.6 for the types of storage batteries contained within the room.
0.1. Hazard identification markings in accordance with NFPA 704.

**Exception:** Existing stationary storage battery systems shall be permitted to include the signage required at the time it was installed.

- A minimum 8 in. (200 mm) wide and 6 in. (150 mm) high sign with CAUTION, WARNING or DANGER
- BATTERY ROOM,
- AUTHORIZED PERSONNEL ONLY, and
- The additional markings required in Section 608.6 for the types of storage batteries contained within the room.

**Exception:** AUTHORIZED PERSONNEL ONLY markings are not required for entrances to occupied work centers complying with Section 608.2.5.

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**608.2.6.2 Cabinet signage.** Battery storage cabinets provided in occupied work centers in accordance with Section 608.2.5 shall have exterior labels that indicate CAUTION, BATTERY STORAGE CABINET, AUTHORIZED PERSONNEL ONLY, identify the manufacturer and the additional markings required in Section 608.6 for model number of the types system and electrical rating (voltage and current) of storage batteries the contained battery system. There shall be signs within the cabinet that indicate the relevant electrical, chemical and hazards, as required by Section 608.6.

**608.2.7.1 Separation.** Stationary storage battery systems located outdoors shall be separated by a minimum five feet (1524 mm) from the following:

- Lot lines
- Public ways
- Buildings
- Stored combustible materials
- Hazardous materials
- High-piled stock
- Other exposure hazards

**Exception:** The fire code official is authorized to approve smaller separation distances if large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress from adjacent buildings, or adversely impact adjacent stored materials or structures.

**608.2.7.2 Means of egress.** Stationary storage battery systems located outdoors shall be separated from any means of egress as required by the fire code official to ensure safe egress under fire conditions, but in no case less than 10 feet (3048 mm).

**Exception:** The fire code official is authorized to approve smaller separation distances if large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress.

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**TABLE 608.3**

<table>
<thead>
<tr>
<th>BATTERY TECHNOLOGY</th>
<th>MAXIMUM ALLOWABLE QUANTITIES (^a)</th>
<th>GROUP H OCCUPANCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead acid, all types</td>
<td>600 KWh, unlimited</td>
<td>Group H-4 Not Applicable</td>
</tr>
<tr>
<td>Nickel cadmium (Ni-Cd),</td>
<td>600 KWh, unlimited</td>
<td>Group H-4 Not Applicable</td>
</tr>
<tr>
<td>Lithium, all types</td>
<td>600 KWh</td>
<td>Group H-2</td>
</tr>
<tr>
<td>Sodium, all types</td>
<td>600 KWh</td>
<td>Group H-2</td>
</tr>
<tr>
<td>Flow batteries (^b)</td>
<td>600 KWh</td>
<td>Group H-2</td>
</tr>
<tr>
<td>Other battery technologies</td>
<td>200 KWh</td>
<td>Group H-2 (^c)</td>
</tr>
</tbody>
</table>

\(^a\) For batteries rated in Amp-Hours, Watt-hours (Wh) shall equal rated battery voltage times the Amp-hour rating divided by 1000.

\(^b\) Shall include vanadium, zinc-bromine, polysulfide-bromide, and other flowing electrolyte type technologies.

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2016 ICC PUBLIC COMMENT AGENDA
c. Shall be a Group H-4 occupancy if the fire code official determines that a fire or thermal runaway involving the battery technology does not represent a significant fire hazard

608.4.3 Energy management system. An approved energy management system shall be provided for battery technologies other than lead acid and nickel cadmium for monitoring and balancing cell voltages, currents and temperatures within the manufacturer's specifications. The system shall transmit an alarm signal to an approved location if potentially hazardous temperatures or other conditions such as short circuits, overvoltage (overcharge) or under voltage (over discharge) are detected.

608.5.1 Fire suppression systems. Rooms containing stationary storage battery systems shall be equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1. Commodity classifications for specific technologies of storage batteries shall be in accordance with Chapter 5 of NFPA 13. If the storage battery types are not addressed in Chapter 5 of NFPA 13, the fire code official is authorized to approve the fire suppression system based on full scale fire and fault condition testing conducted or witnessed and reported by an approved laboratory.

Exception: Spaces or areas containing stationary storage battery systems used exclusively for telecommunications equipment in accordance with Section 903.2.

608.5.3 Mechanical ventilation Ventilation. Where required by Section 608.6 or Section 608.1.4.3, ventilation of rooms containing stationary storage battery systems shall be provided in accordance with the International Mechanical Code and the following:

0.1. The ventilation system shall operate continuously or be designed to operate upon activation limit the maximum concentration of flammable gas to 25% of the gas detection system, lower flammability limit, or for hydrogen 1.0 percent of the total volume of the room; or

0.2. The system Continuous ventilation shall provide ventilation be provided at a rate of not less than 1 cubic foot per minute (cfm) per square foot [(0.00508 m³/(s • m²)] of floor area, but not less than 150 cfm (4 m³/min).

0.3. The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor density greater than 1 and across all parts of the vault ceiling for gases having a vapor density less than 1.

608.5.3.1 Cabinet ventilation. Where cabinets located in occupied spaces contain the storage batteries that are required by Section 608.6 or 608.1.4.3 to be provided with ventilation, the cabinet shall be provided with mechanical ventilation in accordance with Section 608.5.3.

608.5.4 Gas detection system. Where required by Section 608.6 or Section 608.1.4.3, rooms containing stationary storage battery systems shall be protected by a continuous gas detection system. The gas detection system shall be designed to activate where the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL), or where the level of toxic or highly toxic gases exceeds 1/2 of the permissible exposure limits (PEL) IDLH.

608.5.4.1 System activation. Activation of the gas detection system shall result in all the following:

0.1. Initiation of distinct audible and visible alarms in the battery storage room.

0.2. Transmission of an alarm to an approved location.

0.3. De-energizing of the battery charger.

0.4. Activation of the mechanical ventilation system, where the system is interlocked with the gas detection system.

Exception: Lead acid and nickel cadmium stationary storage battery systems shall not be required to comply with items 1, 2, and 3 above.

608.5.5 Spill control and neutralization. Where required by Section 608.6, approved methods and materials shall be provided for the control and neutralization of spills of electrolyte or other hazardous materials in areas containing stationary storage batteries containing free electrolyte. As follows:

0.1. Spill control for battery systems containing more than 55 gallons (208 L) of electrolytes or other hazardous materials shall be provided in accordance with section 6004.2.1 capable of neutralizing a spill of the total capacity from the largest cell or block to a pH between 5.0 and 9.0.

0.2. Neutralization materials or methods shall be provided that are capable of neutralizing a spill of 3.0 percent of the total capacity from the largest battery array cell or equipment block in the room to a pH between 5.0 and 9.0.
608.6.1 **Lead acid storage batteries.** Stationary battery systems utilizing lead acid storage batteries shall comply with the following:

0.1. Mechanical ventilation **Ventilation** shall be provided in accordance with Section 608.5.3.
0.2. Spill control and neutralization shall be in accordance with Section 608.5.5.
0.3. Thermal runaway protection shall be provided for VRLA storage batteries in accordance with Section 608.4.7.
0.4. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.1 shall be provided.

608.6.2 **Nickel cadmium (Ni-Cd) storage batteries.** Stationary battery systems utilizing nickel cadmium (Ni-Cd) storage batteries shall comply with the following:

0.1. Mechanical ventilation **Ventilation** shall be provided in accordance with Section 608.5.3.
0.2. Spill control and neutralization shall be in accordance with Section 608.5.5.
0.3. Thermal runaway protection shall be provided for valve regulated sealed nickel cadmium storage batteries in accordance with Section 608.4.7.
0.4. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.2 shall be provided.

608.6.4 **Sodium beta storage batteries.** Stationary battery systems utilizing sodium beta storage batteries shall comply with the following:

0.1. Mechanical ventilation **Ventilation** shall be provided in accordance with Section 608.5.3.
0.2. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.4 shall be provided.

608.6.5 **Flow storage batteries.** Stationary battery systems utilizing flow storage batteries shall comply with the following:

0.1. Mechanical ventilation **Ventilation** shall be provided in accordance with Section 608.5.3.
0.2. Spill control and neutralization shall be in accordance with Section 608.5.5.
0.3. In addition to the signage required in Section 608.2.6, the following text in Figure 608.6.5 shall be provided:

**Committee Reason:** The proposal was approved as it addresses the needs of new battery and energy systems with regard to safety. The modifications were primarily related to addressing two overall issues. These issues relate to recognizing the excellent safety record for the telecommunications industry and allowing them to continue to do business as usual. The other issue relates to providing flexibility to the quickly changing area of energy storage system technology where appropriate.

**Section 105.6.44 and 608.1.1.** The deletion of proposed section 105.6.44 from the proposal was due to the lack of need for such permits. These systems will still require construction permits. This has not been necessary for the application of Section 608 in the past.

**Section 608.1.2.** A new exception was added for lead acid and nickel cadmium stationary storage battery systems as such a restriction was not seen as necessary based upon the lack of loss history. Limits on height in the building were not seen as necessary for these types of batteries.

**Section 608.2.3.** The array size limits were not necessary for lead acid and nickel cadmium batteries due to their good safety record and lack of experience with thermal runaway. A new exception 2 was added that recognizes the performance of listed lithium ion battery arrays not exceeding 250 KWhs based upon the performance of such arrays demonstrated by the listing. Also, a new exception 4 is added that allows for preengineered and prepackaged systems to be in larger arrays where large scale fire and fault condition testing demonstrates that fire will not spread to an adjacent array. This provides flexibility for the changing and evolving technologies and recognizes systems that are rigorously tested.

**Section 608.2.6 and 608.2.6.2.** Based upon concerns for many existing installations of lead acid and nickel cadmium batteries much of the existing signage language was placed back into the section.

**Section 608.2.7.1 and 608.2.7.2.** These modifications recognize the concept of demonstrating performance of energy systems through full scale fire and fault condition tests. In this case it allows closer proximity to locations such as lot lines and means of egress. This provides flexibility for an industry that is evolving quickly.

**Table 608.3.** Consistent with other modifications this simply returns Table 608.3 to the 2015 allowance permitted for lead acid and nickel cadmium batteries due to the good safety records for such batteries. Limiting to 600 KWh and classifying as Group H-4 was not justified.

**Section 608.4.3** This also relates to the good safety record for lead acid and nickel cadmium batteries. It was not felt to be necessary to provide an energy management system. These energy management systems are more critical to new technologies.
Section 608.5.1. This section would have required automatic sprinkler systems in accordance with NFPA 13. This is something that had not been previously required for lead acid and nickel cadmium batteries and was not seen as necessary now based upon the good safety record of such batteries. This also relates to the current exception in Section 903 for telecommunication facilities.

Sections 608.5.3, 608.5.3.1, 608.6.1, 608.6.2, 608.6.4, 608.6.5. The modifications to these sections was simply to recognize ventilation whether mechanical or nature. The current requirements in the 2015 IFC would not have mandated mechanical. The provisions have been revised to allow this but with the appropriate criteria. Clarification of the applicability of items 1 through 3 in Section 608.5.3 may be necessary. The intention is one of the following but the format of the section does not necessarily reflect this.

Section 608.5.4. The use of 1/2 IDLH is more consistent with a rewrite to gas detection systems. Also the criteria of PEL is considered too low and unreasonable.

Section 608.5.4.1. This modification simply recognizes that previously with lead acid and nickel cadmium batteries that activation of the gas detection system simply activates the mechanical ventilation system and does not require compliance with the other actions such as transmission of an alarm. Again the justification for such a change in requirements was not provided.

Section 608.5.5. This modification makes the provisions related to neutralizing lead acid and nickel cadmium to what was previously allowed based upon the good safety record of such batteries. The proposal had made the requirements more restrictive without justification.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Richard Kluge, representing Ericsson Inc. requests Approve as Modified by this Public Comment.

Modify as follows:

2015 International Fire Code

608.6.1 Lead acid storage batteries. Stationary battery systems utilizing lead acid storage batteries shall comply with the following:

1. Mechanical ventilation shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. Thermal runaway protection shall be provided for VRLA storage batteries in accordance with Section 608.4.7.
4. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.1 shall be provided:

Ventilation rate calculated as follows:

\[ V_r = \frac{(n_c \times C)}{K} \]

where \( V_r \) = Ventilation rate in cfm,
\( n_c \) = Number of battery cells,
\( C \) = Nominal cell capacity which is the 8 h ampere-hour rating to 1.75 V/cell at 25°C (ampere-hours),
\( K \) = A factor of proportionality based on boost/equalize charge at 49°C cell temperature as follows:

Vented Lead Acid (VLA) Batteries: \( K = 1000 \) ampere-hour/cfm, Valve-Regulated Lead-Acid (VRLA) Batteries: \( K = 8200 \) ampere-hour/cfm.

1.2 A ventilation rate as approved by the fire code official based upon the specific application and battery manufacturing data.

2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. Thermal runaway protection shall be provided for VRLA storage batteries in accordance with Section 608.4.7.
4. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.1 shall be provided:

608.6.2 Nickel cadmium (Ni-Cd) storage batteries. Stationary battery systems utilizing nickel cadmium (Ni-Cd) storage batteries shall comply with the following:

1. Mechanical ventilation shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. Thermal runaway protection shall be provided for valve regulated sealed nickel cadmium storage batteries in
4. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.2 shall be provided.

1. Ventilation shall be provided in accordance with Section 608.5.3. The minimum ventilation rate to limit the maximum concentration of flammable gas to 25% of the lower flammability limit shall be in accordance with one of the following:

   1.1 A ventilation rate calculated as follows:

   \[ V_r = \frac{(n_c \times C)}{K} \]

   where \( V_r \) = Ventilation rate in cfm,
   \( n_c \) = Number of battery cells,
   \( C \) = Nominal cell capacity as determined by the 5 h ampere-hour rating to 1.75 V/cell at 20°C (ampere-hours),
   \( K \) = A factor of proportionality equal to 800 ampere-hour/cfm based on boost/equalize charge at 49°C cell temperature.

   1.2 A ventilation rate approved by the fire code official based upon the specific application and battery manufacturing data.

2. Spill control and neutralization shall be in accordance with Section 608.5.5.

3. Thermal runaway protection shall be provided for valve regulated sealed nickel cadmium storage batteries in accordance with Section 608.4.7.

4. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.2 shall be provided.

Commenter's Reason:
Flooded Lead-acid, VRLA and Flooded Ni-Cd batteries have a long safe history as sources of backup power in stationary applications. The hydrogen evolution from these types of batteries is well understood and easy to approximate conservatively. The guidance provided for ventilation is based on the type of battery installed, the number of batteries (cells), and the size (capacity) of the batteries within the space. The gassing rate is based on worst case conditions during equalization/boost charging (not normal operation) at an elevated temperature of 49 degrees C. The value obtained then adds a 5 to 1 safety factor in addition to the inherent 4 x 1 safety factor associated with calculating for 25% of the LFL of hydrogen. The ventilation rates are very conservative since common lead or lead calcium VLA batteries have several times less hydrogen evolution rates compared with lead antimony lead selenium batteries that are considered for the calculation factors. The hydrogen production rates are estimated from IEEE Std 1635-2012 ASHRAE Guideline 21-2012. IEC 62485-2, 2010 for battery room ventilation criteria also was reviewed as additional support for the calculations.

The inclusion of these simple formulas will allow better determination battery ventilation requirements, since it accounts for the number and size (capacity) of the battery plant. An AHJ can quickly verify the number and size of the batteries and whether they are vented lead acid (VLA), valve-regulated lead-acid (VRLA), or nickel cadmium (Ni-Cd).

In most cases the ventilation criteria will be much less than the default, 1 cfm per square foot of the battery room, but in cases where a large number of batteries are concentrated in a small room, it may show additional ventilation is warranted.

Public Comment 2:

Proponent: Michael O'Brian representing Fire Code Action Committee (fcac@icc SAFE.org) requests Approve as Modified by this Public Comment.

Further Modify as Follows:

2015 International Fire Code

608.2.3 Stationary battery arrays. Storage batteries, prepackaged stationary storage battery systems and pre-engineered stationary storage battery systems shall be segregated into stationary battery arrays not exceeding 50 KWh (180 Mega joules) each. Each stationary battery array shall be spaced a minimum three feet (914 mm) from other stationary battery arrays and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exceptions:

1. Lead acid- and nickel cadmium- storage battery arrays.
2. Listed pre-engineered lithium ion battery arrays shall not exceed 250 (900 Mega joules) each.
3. Listed pre-engineered stationary storage battery systems and prepackaged stationary storage battery systems shall not exceed 250 Kwh (540 900 Mega joules) each.
4. The fire code official is authorized to approve listed pre-engineered and prepackaged battery arrays with larger capacities or smaller battery array spacing if large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving one array will not propagate to an
adjacent array, and be contained within the room for a duration equal to the fire resistance rating of the room separation specified in Table 509 of the International Building Code.

608.2.6 Signage Approved signs shall be provided on doors or in locations near entrances to stationary storage battery system rooms and shall include the following or equivalent.

1. The room contains energized battery systems.
2. The room contains energized electrical circuits.
3. AUTHORIZED PERSONNEL ONLY, if required by Section 608.4.
4. The additional markings required in Section 608.6 for the types of storage batteries contained within the room.

Exception: Existing stationary storage battery systems shall be permitted to include the signage required at the time it was installed.

608.4.8 Toxic and highly toxic gas. Stationary storage battery systems that have the potential to release toxic and highly toxic materials during charging, discharging and normal use conditions shall comply with Chapter 60.

608.5.3 Mechanical ventilation. Where required by Section 608.6 or Section 608.1.4.3, ventilation of rooms containing stationary storage battery systems shall be provided in accordance with the International Mechanical Code and the following:

1. The ventilation system shall operate continuously or be designed to operate upon activation of the gas detection system.
2. The ventilation system shall be designed to limit the maximum concentration of flammable gas to 25 percent of the lower flammability limit, or for hydrogen 1.0 percent of the total volume of the room; or
3. The system shall provide ventilation at a rate of not less than 1 cubic foot per minute (cfm) per square foot [0.00508 m³/(s • m²)] of floor area, but not less than 150 cfm (4 m³/min).
4. The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor density greater than air and across all parts of the vault ceiling for gases having a vapor density less than air.

608.5.3.1 Cabinet ventilation. Where cabinets located in occupied spaces contain the storage batteries that are required by Section 608.6 or 608.1.4.3, to be provided with ventilation, the cabinet shall be provided with mechanical ventilation in accordance with Section 608.5.3.

608.5.4 Gas detection system. Where required by Section 608.6 or 608.1.4.3, rooms containing stationary storage battery systems shall be protected by a continuous gas detection system complying with Section 916. The gas detection system shall be designed to activate where the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL), or where the level of toxic or highly toxic gases exceeds 1/2 of the permissible exposure limits (PEL) IDLH.

608.6.1 Lead acid storage batteries. Stationary battery systems utilizing lead acid storage batteries shall comply with the following:

1. Mechanical ventilation shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. Thermal runaway protection shall be provided for VRLA storage batteries in accordance with Section 608.4.7.
4. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.1 shall be provided.

4. The signage in Section 608.2.6 shall also indicate the room contains Lead Acid batteries.

608.6.1 LEAD ACID STORAGE BATTERY SIGNAGE

608.6.2 Nickel cadmium (Ni-Cd) storage batteries. Stationary battery systems utilizing nickel cadmium (Ni-Cd) storage batteries shall comply with the following:
1. **Mechanical ventilation** shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. Thermal runaway protection shall be provided for valve regulated sealed nickel cadmium storage batteries in accordance with Section 608.4.7.
4. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.2 shall be provided.
5. The signage in Section 608.2.6 shall also indicate the room contains nickel cadmium batteries.

### 608.6.2 NICKEL CADMIUM (NI-CD) BATTERY SIGNAGE

This room contains nickel cadmium batteries and energized electrical circuits. Hydrogen gas may be present.

### 608.6.3 Lithium-ion storage batteries

Stationary battery systems utilizing lithium-ion storage batteries shall provide signage contained in accordance with Section 608.2.6 and the text in Figure 608.6.3 shall also indicate the type of lithium batteries in the room.

### 608.6.4 Sodium beta storage batteries

Stationary battery systems utilizing sodium beta storage batteries shall comply with the following:

1. **Mechanical ventilation** shall be provided in accordance with Section 608.5.3.
2. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.4 shall be provided.
3. The signage in Section 608.2.6 shall also indicate the type of sodium batteries in the room and APPLY NO WATER.

### 608.6.5 Flow storage batteries

Stationary battery systems utilizing flow storage batteries shall comply with the following:

1. **Mechanical ventilation** shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. In addition to the signage required in Section 608.2.6, the following text in Figure 608.6.5 shall be provided:
The signage required in Section 608.2.6 shall also indicate the type of flow batteries in the room.

**FLOW BATTERY SIGNAGE**

- **CAUTION: Explosive Fluids**
- This room contains flow batteries that energized electrical circuits. Hydrogen gas may be present.

### 608.6.6 Other battery technologies.

Stationary battery systems utilizing battery technologies other than those described in Sections 608.6.1 through 608.6.5 shall comply with the following:

1. **Continuous flammable gas** detection systems complying with Section 916 shall be provided in accordance with Section 608.5.4 where the batteries have the potential to produce toxic or highly toxic gases in the storage room or cabinet in excess of the permissible exposure limits (PEL) during charging, discharging and normal system operation.
2. Mechanical ventilation shall be provided in accordance with Section 608.5.3.
3. Spill control and neutralization shall be in accordance with Section 608.5.5.
4. In addition to the signage required in Section 608.2.6, the marking shall identify the type of batteries present, describe the potential hazards associated with the battery type, and indicate the room contains energized electrical circuits.

**Commenter’s Reason:** The F95 proposal, as modified, introduced a complete rewrite of this section that addressed hazards associated with new battery technologies and applications. This public comment enhances the proposal as follows:

- **608.2.3 - Exceptions 2 and 3 were not addressed properly with floor modifications at the Louisville hearings. The intent was to allow Listed pre-engineered and prepackaged battery systems to be a maximum of 250 KWh, not just pre-engineered lithium ion battery systems.**

- **608.2.6 – Two changes to this section, as follows:**
  1. Deletes the requirement for a battery room signage to include AUTHORIZED PERSONNEL ONLY markings. This was not required in previous editions of the IFC, and isn’t really necessary since access to battery rooms is not typically provided for the general public.
  2. Deletes the requirements for the NFPA 704 diamond to be provided on battery rooms doors. This is being done because (a) the current signage requirements in this section, and the battery specific signage in Section 608.6 provide sufficient guidance for staff and emergency responders, and (b) because batteries such as lithium ion do not typically have the NFPA 704 criteria included on their MSDS.

608.4.8 - Editorial.
608.5.3, 608.5.3.1 – Editorial, Section 608.1.4.3 doesn’t exist, the correct reference is 608.1.3.
608.5.4, 608.6.6 – The changes are provided to correlate with Proposal F75, a complete rewrite of the IFC gas detection system requirements, which was approved as submitted by the committee.
608.6, several sections – These changes remove the figures showing signage, since it may create confusion with the Section 608.2.6 signage, and might prompt users to require two signs on battery room doors. It also revised battery specific wording to remove text that was already covered in Section 608.2.6 and text that was not felt to be critical for staff and emergency responders.
608.6.4 – Editorial change and includes APPLY NO WATER for the sodium water reactive battery types.
608.6.5 – Editorial change from ‘flow storage battery’ to ‘flow battery’.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)
Proposed Change as Submitted

Proponent: randy schubert, Ericsson, representing Ericsson (randy.schubert@ericsson.com)

2015 International Fire Code

608.6.3 Supervision. Mechanical ventilation systems where required by Sections 608.6.1 and 608.6.2 shall be supervised by an approved central, proprietary or remote station service, or by a monitored building environmental control system and shall initiate an audible and visual signal at a constantly attended on-site location.

2015 International Mechanical Code

[F] 502.4.3 Supervision. Mechanical ventilation systems required by Section 502.4 shall be supervised by an approved central, proprietary or remote station service or by a monitored building environmental control system and shall initiate an audible and visual signal at a constantly attended on-site location.

[F] 502.5.3 Supervision. Mechanical ventilation systems required by Section 502.5 shall be supervised by an approved central, proprietary or remote station service or by a monitored building environmental control system and shall initiate an audible and visual signal at a constantly attended on-site location.

Reason: Large users of stationary batteries have many options that can be used for reliable and safe supervision of battery room ventilation. For example, the telecommunications industry maintains more than 30,000 stationary battery rooms with an exemplary safety record regarding hydrogen control and fire safety. Many of these sites utilize building environmental control monitoring systems with alarms routed to network operations centers (NOCs) that are continuously staffed. Building monitoring systems provide an indication of ventilation failures by several parameters including battery room environmental alarms, battery temperature alarms, and/or exhaust fan operation alarms. When alarms are received personnel are dispatched to the site and corrective actions can be taken if needed. For sites that utilize these systems adding a secondary remote station service would add expense and complexity without improving safety.

An alarm indicating a problem with the ventilation system for a stationary battery room is not an immediate emergency such as with fire and smoke alarms. It is a condition that may pose risk to increasing hydrogen within the room over time. The build-up of hydrogen levels to a dangerous threshold would likely take days or weeks. In 80 years of maintaining lead acid batteries there have been no hydrogen explosions or hydrogen fires in telecommunications buildings for Verizon, CenturyLink, and AT&T.

NFPA 72 contains the most commonly referenced requirements for central, proprietary, and remote stations. The scope of NFPA 72 only addresses the monitoring of fire alarm systems and no other systems. Consequently, there are no performance criteria that define how ventilation alarms should be processed relative to alarms within the scope of NFPA 72 such as fire alarms, supervisory alarms, and trouble alarms. IFC 608.6.3 seems to expand NFPA 72 beyond its intended scope.

The removal of “on-site” criteria is replaced by mandating alarms are sent to a constantly attended location that monitors the spaces 24x7x365 such as a network operation center (NOC).

Cost Impact: Will not increase the cost of construction

The option to use building management and environmental control monitoring systems that provide alarms to constantly attended locations will not impact cost of construction.
Proponent: Jeffrey Betz, AT&T, representing AT&T Corporation (jbetz@att.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

608.6.3 Supervision. Mechanical ventilation systems where required by Sections 608.6.1 and 608.6.2 shall be supervised by an approved central, proprietary or remote station service, or by a monitored building environmental control system and shall initiate an audible and visual signal at a constantly attended location or an approved method of supervision.

2015 International Mechanical Code

[F] 502.4.3 Supervision. Mechanical ventilation systems required by Section 502.4 shall be supervised by an approved central, proprietary or remote station service or by a monitored building environmental control system and shall initiate an audible and visual signal at a constantly attended location or an approved method of supervision.

[F] 502.5.3 Supervision. Mechanical ventilation systems required by Section 502.5 shall be supervised by an approved central, proprietary or remote station service or by a monitored building environmental control system and shall initiate an audible and visual signal at a constantly attended location or an approved method of supervision.

Commenter’s Reason: This modification reflects Hearing Committee members comments and suggested edits from the Louisville hearings. As recommended, during the presentations of both F102-16 and F103-16, this modification continues the current supervision requirements of the existing code and adds the approval opportunity for the Fire Code Official, upon application by the owner, to accept a supervision method based upon a specific site’s circumstances. This proposal will not increase the cost of construction.
Proposed Change as Submitted

Proponent: Jeffrey Betz (jbetz@att.com)

2015 International Fire Code

Add new text as follows:

608.9 Smoke detection. An approved automatic smoke detection system shall be installed in accordance with Section 907.2 in rooms containing stationary battery systems with quantities exceeding those listed in Section 608.1.

Exception: Stand-alone communications equipment structures classified as Group U are not required to install an approved automatic smoke detection system.

907.2.23 Battery rooms. An automatic smoke detection system shall be installed in areas containing stationary storage battery systems in accordance with a liquid capacity of more than 50 gallons (189 L) Section 608.

Reason: The requirement to provide an approved smoke detection system in stand-alone communication equipment structures of Utility and Miscellaneous Group U buildings is unwarranted. These small stand-alone structures do not pose a serious life safety exposure as the structure is rarely occupied. If occupied, visual awareness is the primary notification of an emergency condition. These structures are often considered non-essential by the owner and can be replaced within a short period of time in the rare event of a fire or other damaging condition. The small footprint of the structure and the exposure of the interior equipment to non-thermal or thermal damage at a very small level is a total loss for the equipment housed within. A fire service response will not prevent the necessity of all equipment being replaced.

The current requirements of the code section encompasses single dedicated stand-alone battery/equipment spaces through high-rise multi-use occupancies with a battery room. The code change proposal also aligns this section with the Scope quantities for Stationary Storage Battery Systems.

The provision of an automatic smoke detection system in a room containing batteries with a multi-use/occupied building is appropriate. This proposal is providing an Exception to this broad use/occupancy and removes the burdens placed upon thousands of stand-alone communications equipment structures of Use Group U to provide an approved automatic smoke detection system. These stand-alone communications structures currently have multi-internal monitoring points that address issues related to the operations of the equipment and potential hazards conditions.

The reasoning for smoke detection for battery rooms in a multi-use/occupied building as stated in the 2015 IFC Commentary 907.2.23 is "...Because standby power and emergency power systems control many important building emergency systems and functions, a supervised automatic smoke-detection system is required for early warning notification of a hazardous condition." The detection of rooms housing emergency support functions of the building fire protection and life safety systems noted in the Commentary are justifiable but do not reflect the completely different conditions of the noted Group U structures.

The code does not require any other stand-alone facilities of this size or nature to provide required approved automatic smoke detection systems (see Section 907.2). This proposal does not prevent or limit the installation of either an automatic smoke detection system or single station smoke alarm by an owner if they choose to install such detection.

Cost Impact: Will not increase the cost of construction

The required design, installation, inspection, testing and maintenance and monitoring for an approved automatic smoke detection system are an unnecessary expenses for the owner of a structure of this nature.
loop of requirement by removing the specific requirement in Section 907.2.23. It should be noted that the committee felt that the exception to Section 608.9 may be warranted.

**Assembly Action:** None

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**Individual Consideration Agenda**

**Public Comment 1:**

Proponent: Jeffrey Betz, AT&T, representing AT&T Corporation (jbetz@att.com) requests Approve as Modified by this Public Comment.

**Modify as Follows:**

**2015 International Fire Code**

**608.9 Smoke detection.** An approved automatic smoke detection system shall be installed in accordance with Section 907.2 in rooms containing stationary storage battery systems with quantities exceeding those listed in Section 608.1.

**Exception:** Stand-alone communications equipment structures classified as Group U are not required to install an approved automatic smoke detection system.

**907.2.23 Battery rooms.** An automatic smoke detection system shall be installed in areas containing stationary storage battery systems in accordance with Section 608.

**Exception:** Stand-alone communication equipment structures classified as Group U are not required to install an approved automatic smoke detection system.

**Commenter's Reason:** Modification clearly states the intent to provide an exception for communication equipment structures classified as Group U. This modification eliminates the confusing looping of code sections in the original proposal as identified by the Code Hearing Committee and opposition speakers.

The small stand-alone structures do not pose a serious life safety exposure as the structures are rarely occupied. If occupied, visual awareness is the primary notification of an emergency condition. This modification does not remove the requirement for an approved automatic smoke detection system in a multi-use and/or occupied building protecting the standby power and emergency power systems. (Paraphrased from 2015 IFC Commentary 907.2.23).
Proposed Change as Submitted

Proponent: Jonathan Roberts, representing Underwriters Laboratory (jonathan.roberts@ul.com)

2015 International Fire Code
Add new text as follows:

[M] 609.2 Where required. A Type I hood shall be installed at or above all commercial cooking appliances and domestic cooking appliances used for commercial purposes that produce grease vapors.

Exceptions:

Exception: A Type I hood shall not be required for an electric cooking appliance where an approved testing agency provides documentation that the appliance effluent contains 5 mg/m³ or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m³/s) in accordance with UL 710B.

1. Factory-built commercial exhaust hoods that are listed and labeled in accordance with UL 710, and installed in accordance with Section 304.1 of the International Mechanical Code, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5 of the International Mechanical Code.

2. Factory-built commercial cooking recirculating systems that are listed and labeled in accordance with UL 710B, and installed in accordance with Section 304.1 of the International Mechanical Code, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5 of the International Mechanical Code. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3.1.1 of the International Mechanical Code. For the purpose of determining the floor area required to be ventilated, each individual appliance shall be considered as occupying not less than 100 square feet (9.3 m²).

3. Where cooking appliances are equipped with integral down-draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application in accordance with NFPA 96, a hood shall not be required at or above them.

4. A Type I hood shall not be required for an electric cooking appliance where an approved testing agency provides documentation that the appliance effluent contains 5 mg/m³ or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m³/s) in accordance with UL 710B.

Reason: This proposal will better correlate Sections 507.1 and 507.2 of the International Mechanical Code with the International Fire Code. There are several alternatives to a traditional Type 1 hood for the exhaust of cooking appliances that produce grease vapors. The specific requirements for the installation of these alternative methods are contained in Section 507 of the IMC. Section 609.1 of the IFC requires the installation of the hoods in accordance with the IMC. It should be noted that current IFC Section is not a direct extract of IMC text, but a compilation of the 2015 IMC Sections 507.1 and 507.2.

Cost Impact: Will not increase the cost of construction
Reduces the cost of construction by aligning the IFC requirements with the IMC.

Committee Action: Approved as Submitted
Committee Reason: This proposal keeps the IFC and IMC consistent on the requirements for Type I hoods. There was some concern raised that this should simply be a direct reference back to the IMC but in either case correlation was necessary.
Assembly Action: None

Individual Consideration Agenda

Proponent: Guy McMann, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us) requests Disapprove.
**Commenter's Reason:** This proposal adds no value to the IFC. The proposed change copies over the exceptions from IMC Section 507.1 and adds the existing exception to IFC Section 609.2 as #4. These are construction requirements and are best understood in the context of the Mechanical Code.
Proposed Change as Submitted

Proponent: Michael O'Brien representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code
Add new text as follows:

105.7.9 Fuel cell power systems. A construction permit is required to install stationary fuel cell power systems.

Add new definition as follows:

SECTION 202 DEFINITIONS

FUEL CELL POWER SYSTEM, STATIONARY. A stationary energy generation system that converts the chemical energy of a fuel and oxidant to electric energy (DC or AC electricity) by an electrochemical process.

Field fabricated fuel cell power system. A stationary fuel cell power system that is assembled at the job site and is not a pre-engineered or prepackaged factory assembled fuel cell power system.

Pre-engineered fuel cell power system. A stationary fuel cell power system consisting of components and modules that are produced in a factory, and shipped to the job site for assembly.

Prepackaged fuel cell power system. A stationary fuel cell power system that is factory assembled as a single, complete unit and shipped as a complete unit for installation at the job site.

Revise as follows:

602.1 Definitions. The following terms are defined in Chapter 2:

BATTERY SYSTEM, STATIONARY LEAD-ACID.
BATTERY TYPES.
COMMERCIAL COOKING APPLIANCES.
CRITICAL CIRCUIT.
EMERGENCY POWER SYSTEM.
FUEL CELL POWER SYSTEM, STATIONARY.

FIELD FABRICATED FUEL CELL POWER SYSTEM.

PRE-ENGINEERED FUEL CELL POWER SYSTEM.

PREPACKAGED FUEL CELL POWER SYSTEM.

EMERGENCY POWER SYSTEM HOOD.

HOOD Type I.
Type II.

REFRIGERANT.
REFRIGERANT REFRIGERATION SYSTEM.

REFRIGERATION STANDBY POWER SYSTEM.
STANDBY POWER SYSTEM.

Add new text as follows:

CHAPTER PART 612—STATIONARY FUEL CELL POWER SYSTEMS

612.1 General. Stationary fuel cell power systems in new and existing occupancies shall comply with this section.

612.2 Permits. Permits shall be obtained for stationary fuel cell power systems as set forth in Sections 105.7.9.

612.3 Equipment. Stationary fuel cell power systems shall comply with the following:

1. Prepackaged fuel cell power systems shall be listed and labeled in accordance with CSA FC 1.

2. The modules and components in a pre-engineered fuel cell power system shall be listed and labeled in accordance with CSA FC 1 and interconnected to complete the assembly of the system at the job site in accordance with the manufacturer's instructions and their listings.

3. Field fabricated fuel cell power systems shall be approved based on a review of the technical report provided in accordance with Section 104.7.2. The report shall be prepared by, and bear the stamp of a registered design professional and shall include:

   3.1 A fire risk evaluation.

   3.2 An evaluation demonstrating that modules and components in the fuel cell power system comply with applicable requirements in CSA FC 1.
3.3 Documentation of the fuel cell power system's compliance with applicable NFPA 2 and NFPA 853 construction requirements.

612.4 Installation. Stationary fuel cell power systems shall be installed and maintained in accordance with NFPA 70 and NFPA 853, the manufacturer's installation instructions, and the listing. Stationary fuel cell power systems fueled by hydrogen shall be installed and maintained in accordance with NFPA 2 and NFPA 70, the manufacturer's installation instructions, and the listing.

612.5 Residential use. Stationary fuel cell power systems shall not be installed in Group R-3 and R-4 buildings, or dwelling units associated with Group R-2 buildings unless they are specifically listed for residential use.

612.6 Indoor installations. Stationary fuel cell power systems installed in indoor locations shall comply with this section. For purposes of this section an indoor location includes a roof and 50 percent or greater enclosing walls.

612.6.1 Listed. The stationary fuel cell power systems installed indoors shall be specifically listed and labeled for indoor use.

612.6.2 Separation. Where stationary fuel cell power systems are installed indoors the indoor area in which the system is located shall be treated as an incidental use area and be separated from Group B, F, M, S and U occupancies by one-hour fire resistive construction, and from Group A, E, I and R occupancies by two-hour fire resistive construction. Separation shall be provided in accordance with Section 509 of the International Building Code. Exception: Stationary fuel cell power systems with an aggregate rating less than 50 Kw shall not be required to be separated from other occupancies provided the systems comply with NFPA 853, Section 9.3 requirements.

612.6.2.1 Group F, S and U occupancies. Stationary fuel cell power systems located outside of an incidental use area within Group F, S and U occupancies shall be separated from other F, S and U occupancies and Group B and M occupancies by one-hour fire resistive construction, and from Group A, E, I and R occupancies by two-hour fire resistive construction.

612.6.2.2 Group A, B, E, I, M or R occupancies. Stationary fuel cell power systems shall not be located in Group A, B, E, I, M or R occupancies unless treated as an incidental use as required in Section 612.6.2.

612.7 Vehicle impact protection. Where stationary fuel cell power systems are subject to impact by a motor vehicle, vehicle impact protection shall be provided in accordance with Section 312.

612.8 Separation. Stationary fuel cell power systems located outdoors shall be separated by not less than five feet (1524 mm) from the following:

1. Lot lines
2. Public ways
3. Buildings
4. Stored combustible materials
5. Hazardous materials
6. High-piled stock
7. Any portion of a designated means of egress system
8. Other exposure hazards

612.9 Fuel supply. The design, location and installation of the fuel supply for stationary fuel cell power systems shall comply with Chapter 53, Chapter 58 and the International Fuel Gas Code based on the particular fuel being supplied to the system.

612.10 Manual shutoff. An accessible manual shutoff valve shall be provided for the fuel piping within 6 feet (1.8 m) of any fuel storage tank serving the fuel cell and within 6 feet (1.8 m) of the power system. If the fuel tank and the stationary fuel cell power system are less than 12 feet (3.6 m) apart, a single shutoff valve shall be permitted. If the stationary fuel cell power system is located indoors the shutoff valve shall be located outside of the room in which the system is installed, unless otherwise approved by the code official.

612.11 Ventilation and exhaust. Ventilation and exhaust for fuel cell systems shall be provided in accordance with NFPA 853.

612.12 Fire suppression. Fire suppression for fuel cell power system installations shall be provided in accordance with NFPA 853.

612.13 Gas detection systems. Fuel cell power systems shall be provided with a gas detection system. Detection shall be provided in approved locations in the fuel cell power system enclosure, the exhaust system, or the room that encloses the fuel cell power system. The system shall be designed to activate at a flammable gas concentration of not more than 25 percent of the lower flammable limit (LFL).

612.13.1 System activation. The activation of the gas detection system shall automatically:

1. Close valves between the gas supply and the fuel cell power system.
2. Shut down the fuel cell power system.
Initiate local audible and visible alarms in approved locations.

Reference standards type: This reference standard is new to the ICC Code Books

Add new standard(s) as follows:

CSA AMERICA INC.  8501 East Pleasant Valley Road Cleveland, Ohio 44131
CSA FC 1 – 2012 Stationary Fuel Cell Power Systems

NFPA Standard

853 – 15 Installation of Stationary Fuel Cell Power Systems

Reason: Fuel cell power systems are being used in ever increasing numbers to meet facility energy needs. Stationary fuel cell power systems generate power through an electrochemical process that combines hydrogen and oxygen to produce electricity. The hydrogen comes from a direct hydrogen source or from any hydrocarbon fuel such as natural gas, gasoline, diesel, or methanol if the fuel cell power system includes integral reforming. The oxygen comes from air around the fuel cell. A new section is being proposed in the IFC which provides a comprehensive set of requirements to mitigate potential hazards associated with the installation and use of stationary fuel cell power systems.

Three referenced documents form the basis for these requirements:

ANSI/CSA FC 1 standard is used to investigate and list the stationary fuel cells covered by this section. The construction and performance requirements in that standard address a variety of hazards, including mechanical, electrical, thermal, malfunction, erroneous human intervention and environmental.

NFPA 853, the Standard for the Installation of Stationary Fuel Cell Power Systems includes requirements for the design, construction, and installation of stationary fuel cell power systems.

NFPA 2, the Hydrogen Technologies Code covers the production, storage, transfer, and use of hydrogen in all occupancies and on all premises. Chapter 12 of this code includes requirements for the design, construction, and installation of stationary fuel cell power systems which are extracted from NFPA 853.

Comments on portions of the proposal are as follows:

612.3 - Currently three companies have prepackaged stationary fuel cell power systems listed by UL for nonresidential indoor and outdoor use, so it is appropriate to require these products to be listed since it will be difficult if not impossible for fire code officials to verify that the systems comply with NFPA 853.

The listing and installation requirements proposed in this section for prepackaged, pre-engineered and field fabricated stationary fuel cell power systems are consistent with, but not identical to, NFPA 853 requirements.

The criteria for approving field fabricated fuel cell power systems is based on NFPA 853 and criteria that is difficult for the code official to obtain and evaluate during plan review and initial inspection.

612.5 – Systems are listed for both residential and nonresidential use based on requirements in the two referenced documents noted above.

612.6 – Systems are listed for either indoor or outdoor use. The 50% wall limitation is from NFPA 853, Section 3.3.15.2. Occupancy separations are based on the incidental use occupancy separations established for hydrogen fuel rooms and stationary battery systems (see IBC table 509).

Exception 1 that allows systems in industrial type occupancies is consistent with the requirements in NFPA 853, Section 5.3.

612.6.3 is based on IBC Section 905.3.1 and will make sure the indoor stationary fuel cell power systems are in locations that can be effectively responded to by the fire department and emergency responders if needed.

612.8 separation requirements are based on, but not identical to, separation requirements in NFPA 853, Section 5.1.1, and are provided in the IFC as a convenience for the code user.

612.10 – Manual shutoff requirements are based on, but not identical to, requirements in NFPA 853, Section 6.4.

612.11 – Ventilation, exhaust, fire suppression and gas detection are important parts of a safe installation and references to NFPA 853 are provided as a convenience to the code user.

612.3 – Gas detection system requirements include detection locations from UL 853 and activation criteria that are consistent with IFC requirements.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)
Cost Impact: Will increase the cost of construction
There are no requirements in the code that specifically regulate these systems. Complying with the proposed requirements will result in increased construction and maintenance expenses.

Public Hearing Results

Committee Action: Disapproved
Committee Reason: The committee felt the proposal had merit but the separation requirements needed clarification and refinement.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O’Brien representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

612.6.2 Separation. Where Rooms containing stationary fuel cell power systems are installed indoors the indoor area in which the system is located shall be treated as an incidental use area and be separated from the following occupancies by fire barriers or horizontal assemblies, or both, constructed in accordance with the International Building Code.

1. Group B, F, M, S and U occupancies by one-hour fire resistive construction, and from

Exception: Stationary fuel cell power systems with an aggregate rating less than 50 Kw shall not be required to be separated from other occupancies provided the systems comply with NFPA 853, Section 9.3 requirements.

612.6.2.1 Group F, S and U occupancies. Stationary fuel cell power systems located outside of an incidental use area within Group F, S and U occupancies shall be separated from other F, S and U occupancies and Group B and M occupancies by one-hour fire resistive construction, and from Group A, E, I and R occupancies by two-hour fire resistive construction.

612.6.2.2 Group A, B, E, I, M or R occupancies. Stationary fuel cell power systems shall not be located in Group A, B, E, I, M or R occupancies unless treated as an incidental use as required in Section 612.6.2.

612.8 Separation Outdoor installation. No change to text.

2015 International Building Code

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles hazardous materials as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the International Fire Code.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the International Fire Code.
3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour fire barriers constructed in accordance with Section 707 or 1 hour horizontal assemblies constructed in accordance with Section 711, or both.
5. Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary batteries utilized for facility emergency power, uninterruptable power supply or telecommunication facilities, provided that the batteries are provided with safety venting caps and ventilation is provided in accordance with the International Mechanical Code.

10. Corrosive personal or household products in their original packaging used in retail display.

11. Commonly used corrosive building materials.

12. Buildings and structures occupied for aerosol storage shall be classified as Group S-1, provided that such buildings conform to the requirements of the International Fire Code.

13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per control area in Group M or S occupancies complying with Section 414.2.5.

14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the International Fire Code.

15. Stationary fuel cell power systems installed in accordance with the International Fire Code.

Commenter's Reason: The committee correctly identified that the separation requirements for stationary fuel cell power systems in incidental use areas of buildings was not properly addressed. This public comment fixes this by clarifying the separation criteria in Section 612.6.2, and deleting Sections 612.6.2.1 and 612.6.2.2 which were a little confusing, and were not really needed. The title of Section 612.8 was also revised to clarify that the focus of that section was outdoor installations. Also IBC Section 307.1.1 was revised to clarify that occupancies that employ fuel cells are not automatically classified as Group H. With these revisions the separation requirements for stationary fuel cell power systems are consistent with NFPA 853, and with the IFC/IBC requirements for stationary storage battery systems.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC
Proposed Change as Submitted

Proponent: Michael O’Brien representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code

Add new text as follows:

**105.6.14 Capacitor energy storage systems.** An operational permit is required for the operation of capacitor energy storage systems regulated by Section 612.

**105.7.4 Capacitor energy storage systems.** A permit is required to install capacitor energy storage systems regulated by Section 612.

Add new definition as follows:

**SECTION 202 DEFINITIONS**

**CAPACITOR ENERGY STORAGE SYSTEM.** A stationary, rechargeable energy storage system consisting of capacitors, chargers, controls, and associated electrical equipment designed to provide electrical power to a building. The system is typically used to provide standby or emergency power, an uninterruptable power supply, load shedding, load sharing or similar capabilities.

**Pre-engineered capacitor energy storage system.** A capacitor energy storage system consisting of capacitors, an energy management system, components and modules that are produced in a factory, designed to comprise the system when assembled and shipped to the job site for assembly.

**Prepackaged capacitor energy storage system.** A capacitor energy storage system consisting of capacitors, an energy management system, components and modules that is factory assembled and then shipped as a complete unit for installation at the job site.

Add new text as follows:

**SECTION 612 CAPACITOR ENERGY STORAGE SYSTEMS**

**612.1 Scope.** Capacitor energy storage systems having capacities exceeding 70 KWh (252 Mega joules) shall comply with this section.

**612.1.2 Permits.** Permits shall be obtained for the installation and operation of capacitor energy storage systems in accordance with Sections 105.6.14 and 105.7.4.

**612.1.3 Construction documents.** The following information shall be provided with the permit application:

1. Location and layout diagram of the room in which the capacitor energy storage system is to be installed
2. Details on hourly fire-resistant rated assemblies provided
3. Quantities and types of capacitors in the system
4. Manufacturer’s specifications, ratings and listings of capacitors and capacitor energy storage systems
5. Location and content of signage
6. Details on fire suppression, smoke detection and ventilation systems.
7. Rack storage arrangement, including seismic support criteria.

**612.1.4 Hazard mitigation analysis.** A hazard mitigation analysis, applicable to the capacitors shall be approved and comply with Section 612.1.4.1 and 612.1.4.2 and this section. A failure modes and effects analysis (FMEA) or other approved hazard mitigation analysis shall be provided in accordance with Section 104.7.2 under any of the following conditions:

1. Capacitor technologies not specifically identified in this code are provided.
2. More than one capacitor energy storage system technology is provided in a room or indoor area where there is a potential for adverse interaction between technologies.
3. When allowed as a basis for increasing maximum allowable quantities.

**612.1.4.1 Fault condition.** The hazard mitigation analysis shall evaluate the consequences of the following failure modes, and others deemed necessary by the fire code official. Only single failure modes shall be considered.

1. Thermal runaway condition in a single capacitor rack, module or array.
2. Failure of any energy management system.
3. Failure of any required ventilation system.
4. Voltage surges on the primary electric supply.
5. Short circuits on the load side of the capacitor energy storage system.
6. Failure of the smoke detection, fire suppression, or gas detection system.
7. Spill neutralization not being provided or failure of the secondary containment system.

612.1.4.2 Analysis approval. The fire code official is authorized to approve the hazardous mitigation analysis provided the consequences of the hazard mitigation analysis demonstrate:

1. Fires or explosions will be contained within unoccupied capacitor energy storage rooms for the minimum duration of the fire resistance rated walls identified in IBC table 509.1.
2. Fires and explosions in cabinets in occupied work centers will be detected in time to allow occupants within the room to safely evacuate.
3. Toxic and highly toxic gases released during fires and other fault conditions shall not reach concentrations in access of IDLH level in the building or adjacent means of egress routes during the time deemed necessary to evacuate from that area.
4. Flammable gases released from batteries during charging, discharging and normal operation shall not exceed 25% of their lower flammability limit (LFL).
5. Flammable gases released from batteries during fire, overcharging and other abnormal conditions shall not create an explosion hazard that will injure occupants or emergency responders.

612.1.5 Seismic and structural design. Capacitor energy storage systems shall comply with the seismic design requirements in Chapter 16 of the International Building Code, and shall not exceed the floor loading limitation of the building.

612.1.6 Vehicle impact protection. Where capacitor energy storage systems are subject to impact by a motor vehicle, including fork lifts, vehicle impact protection shall be provided in accordance with Section 312.

612.1.7 Combustible storage. Combustible materials not related to the capacitor energy storage system shall not be stored in capacitor rooms.

612.1.8 Testing, maintenance and repairs. Capacitors and associated equipment and systems shall be tested and maintained in accordance with the manufacturer's instructions. Any capacitors or system components used to replace existing units shall be compatible with the capacitor charger, energy management systems, other capacitors, and other safety systems. Introducing other types of capacitors into the capacitor energy storage system shall be treated as a new installation and require approval by the fire code official before the replacements are introduced into service.

612.2 Location, construction and signage. The location, construction and signage for capacitor energy storage systems shall be in accordance with Sections 612.2.1 through 612.2.4.

612.2.1 Location and construction. The location and construction of capacitor energy storage systems within buildings shall be in accordance with Sections 612.2.1.1 through 612.2.1.5.1.

612.2.1.1 Location. Capacitor energy storage systems shall not be located in areas where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, or where the floor level is more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge.

612.2.1.2 Separation. Rooms containing capacitor energy storage systems shall be separated from other areas of the building in accordance with Section 509.1 of the International Building Code. Capacitor energy storage systems shall be allowed to be in the same room with the equipment they support.

612.2.1.3 Capacitor energy storage system arrays. Capacitor energy storage systems shall be segregated into arrays not exceeding 50 Kwh (180 Mega joules) each. Each array shall be spaced a minimum three feet (914 mm) from other arrays and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exception: Listed pre-engineered capacitor energy storage systems and listed prepackaged capacitor energy storage systems shall not exceed 150 Kwh (540 Mega joules) each.

612.2.1.4 Separate rooms. Where stationary batteries are installed in a separate equipment room accessible only to authorized personnel, they shall be permitted to be installed on an open rack for ease of maintenance.

612.2.1.5 Occupied work areas. Where stationary capacitors are located in an occupied work center, they shall be housed in a noncombustible cabinet or other enclosure to prevent access by unauthorized personnel.

612.2.2 Signage. Approved signs shall be provided on doors or in locations adjacent to the entrances to capacitor energy storage system rooms and shall include the following or equivalent:

1. A minimum 8 in. (200 mm) wide and 6 in. (150 mm) high sign with:
a. CAUTION
b. CAPACITOR ENERGY STORAGE ROOM
c. THIS ROOM CONTAINS ENERGIZED ELECTRICAL CIRCUITS, AUTHORIZED PERSONNEL ONLY, and
d. An identification of the type of capacitors present and the potential hazards associated with the capacitor type.

2. Hazard identification markings in accordance with NFPA 704.

**Exception:** AUTHORIZED PERSONNEL ONLY markings are not required for entrances to occupied work centers that comply with Section 608 requirements.

612.2.3 **Cabinet signage.** Capacitor energy storage systems located in cabinets provided in occupied work centers in accordance with Section 608.2.5 shall have exterior labels that indicate CAUTION, CAPACITOR ENERGY SYSTEM CABINET, THIS CABINET CONTAINS ENERGIZED ELECTRICAL CIRCUITS, AUTHORIZED PERSONNEL ONLY.

612.2.4 **Electrical disconnects.** Where the capacitor energy storage system disconnecting means is not within sight of the main service disconnecting means, placards or directories shall be installed at the location of the main service disconnecting means indicating the location of the capacitor energy storage system disconnecting means in accordance with NFPA 70.

612.2.5 **Outdoor installations.** Capacitor energy storage systems located outdoors shall comply with Sections 612.2.5.1 through 612.2.5.4, in addition to all applicable requirements of Section 612. Installations in outdoor enclosures or containers which can be occupied for servicing, testing, maintenance and other functions shall be treated as capacitor energy storage system rooms.

**Exception:** Capacitor energy storage arrays in noncombustible containers shall not be required to be spaced three feet (914 mm) from the container walls.

612.2.5.1 **Separation.** Capacitor energy storage systems located outdoors shall be separated by a minimum five feet (1524 mm) from the following:

1. Lot lines
2. Public ways
3. Buildings
4. Stored combustible materials
5. Hazardous materials
6. High-piled stock
7. Other exposure hazards

612.2.5.2 **Means of egress.** Capacitor energy storage systems located outdoors shall be separated from any means of egress as required by the fire code official to ensure safe egress under fire conditions, but in no case less than 10 feet (3048 mm).

612.2.5.3 **Security of outdoor areas.** Outdoor areas in which capacitor energy storage systems are located shall be secured against unauthorized entry and safeguarded in an approved manner.

612.2.5.4 **Walk in units.** Where a capacitor energy storage system includes an outer enclosure, the unit shall only be entered for inspection, maintenance and repair of batteries and electronics, and shall not be occupied for other purposes.

612.3 **Maximum allowable quantities.** Fire areas within buildings containing capacitor energy storage systems that exceed 600 KWh of energy capacity shall comply with all applicable High Hazard Group H occupancy requirements in this code and the International Building Code.

**Exception:** Where approved by the fire code official, areas containing capacitor energy storage systems that exceed 600 KWh shall be treated as incidental use areas and not Group H occupancies based on a hazardous mitigation analysis in accordance with Section 612.1.4 and large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory.

612.4 **Capacitors and equipment.** The design and installation of capacitors, capacitor energy storage systems, and related equipment shall comply with this section.

612.4.1 **Cabinets.** Where stationary capacitors are contained in cabinets in occupied work centers, the cabinet enclosures shall be located within 10 feet (3048 mm) of the equipment that they support.

612.4.1.1 **Listings.** Capacitors and capacitor energy storage systems shall comply with the following:

1. Capacitors shall be listed in accordance with UL 1973.
2. Prepackaged and pre-engineered stationary capacitor energy storage systems shall be listed in accordance with UL 9540.

612.4.2 **Prepackaged and pre-engineered systems.** Prepackaged and pre-engineered capacitor energy storage systems.
shall be installed in accordance with their listing and the manufacturer's instructions.

612.4.3 **Energy management system.** An approved energy management system shall be provided for monitoring and balancing capacitor voltages, currents and temperatures within the manufacturer's specifications. The system shall transmit an alarm signal to an approved location if potentially hazardous temperatures or other conditions such as short circuits, overvoltage (overcharge) or under voltage (over discharge) are detected.

612.4.4 **Capacitor chargers.** Capacitor chargers shall be compatible with the capacitor manufacturer's electrical ratings and charging specifications. Capacitor chargers shall be listed and labeled in accordance with the UL 1564 or provided as part of a listed pre-engineered or prepackaged capacitor energy storage system.

612.4.5 **Inverters.** Inverters shall be listed and labeled in accordance with UL 1741. Only inverters listed and labeled for utility interactive system use and identified as interactive shall be permitted to operate in parallel with the electric utility power system to supply power to common loads.

612.4.6 **Toxic and highly toxic gas.** *Capacitor energy storage systems* that have the potential to release toxic and highly toxic materials during charging, discharging and normal use conditions shall comply with Chapter 60.

612.5 **Detection and protection systems.** Fire suppression, smoke detection, mechanical ventilation and gas detection shall be provided in rooms containing capacitor energy storage systems as required for stationary storage battery systems in accordance with Section 608.5 through 608.5.4.

612.5.1 **Fire suppression systems.** Rooms containing capacitor energy storage systems shall be equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1. Commodity classifications for specific technologies capacitors shall be in accordance with Chapter 5 of NFPA 13. If the capacitor types are not addressed in Chapter 5 of NFPA 13, the fire code official is authorized to approve the fire suppression system based on full scale fire and fault condition testing conducted or witnessed and reported by an approved laboratory.

612.5.1.1 **Alternative suppression systems.** Capacitor energy systems that utilize water reactive materials shall be protected by an approved automatic fire-extinguishing system in accordance with Section 904. The system shall be listed for protecting the type, arrangement and quantities of capacitors in the room. The fire code official shall be permitted to approve the alternate fire suppression system based on full scale fire and fault condition testing conducted or witnessed and reported by an approved laboratory.

612.5.2 **Smoke protection system.** An approved automatic smoke detection system shall be installed in rooms containing capacitor energy storage systems in accordance with Section 907.2.

612.5.3 **Mechanical ventilation.** Ventilation of rooms containing capacitor energy storage systems shall be provided in accordance with the *International Mechanical Code* and the following:

1. The ventilation system shall operate continuously or be designed to operate upon activation of the gas detection system.
2. The system shall provide ventilation at a rate of not less than 1 cubic foot per minute (cfm) per square foot \([0.00508 \text{ m}^3/(s \cdot \text{m}^2)]\) of floor area, but not less than 150 cfm (4 m\(^3\)/min).
3. The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor density greater than air and across all parts of the vault ceiling for gases having a vapor density less than air.

612.5.3.1 **Cabinet ventilation.** Cabinets located in occupied spaces containing capacitors shall be provided with mechanical ventilation in accordance with this section.

612.5.3.2 **Supervision.** Required mechanical ventilation systems for rooms and cabinets containing capacitors shall be supervised by an approved central station, proprietary or remote station service or shall initiate an audible and visual signal at an approved constantly attended on-site location.

612.5.4 **Gas detection system.** Rooms containing stationary capacitor energy storage systems shall be protected by a continuous gas detection system. The gas detection system shall be designed to activate where the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL), or where the level of toxic or highly toxic gases exceeds the permissible exposure limits (PEL).

612.5.4.1 **System activation.** Activation of the gas detection system shall result in all the following:

1. Initiation of distinct audible and visible alarms in the capacitor energy storage system room.
2. Transmission of an alarm to an approved location.
3. De-energizing of the capacitor.
4. Activation of the mechanical ventilation system, where the system is interlocked with the gas detection system.
612.6 **Spill control and neutralization.** Capacitor energy storage systems that contain free electrolytes and other hazardous materials shall be provided with spill control and neutralization as required in Section 608.5.5 for stationary storage battery systems.

907.2.24 (IBC [F] 907.2.24) **Capacitor energy storage systems.** An automatic smoke detection system shall be installed in areas containing capacitor energy storage systems as required by Section 612.

**2015 International Building Code**

Revise as follows:

[F] 307.1.1 **Uses other than Group H.** An occupancy that stores, uses or handles hazardous materials as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour fire barriers constructed in accordance with Section 707 or 1-hour horizontal assemblies constructed in accordance with Section 711, or both.
5. Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary batteries utilized for facility emergency power, uninterruptable power supply or telecommunication facilities, provided that the batteries are provided with safety venting caps and ventilation is provided in accordance with the *International Mechanical Code*.
10. Capacitor energy storage systems installed in accordance with the *International Fire Code*.
11. Corrosive personal or household products in their original packaging used in retail display.
12. Commonly used corrosive building materials.
13. Buildings and structures occupied for aerosol storage shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
14. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per control area in Group M or S occupancies complying with Section 414.2.5.
15. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.

### TABLE 509

<table>
<thead>
<tr>
<th>ROOM OR AREA</th>
<th>SEPARATION AND/OR PROTECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furnace room where any piece of equipment is over 400,000 Btu per hour input</td>
<td>1 hour or provide automatic sprinkler system</td>
</tr>
<tr>
<td>Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower</td>
<td>1 hour or provide automatic sprinkler system</td>
</tr>
<tr>
<td>Refrigerant machinery room</td>
<td>1 hour or provide automatic sprinkler system</td>
</tr>
<tr>
<td>Hydrogen fuel gas rooms, not classified as Group H</td>
<td>1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.</td>
</tr>
<tr>
<td>Incinerator rooms</td>
<td>2 hours and provide automatic sprinkler system</td>
</tr>
<tr>
<td>Paint shops, not classified as Group H, located in occupancies other than Group F</td>
<td>2 hours; or 1 hour and provide automatic sprinkler system</td>
</tr>
<tr>
<td>In Group E occupancies, laboratories and vocational shops not classified as Group H</td>
<td>1 hour and provide automatic sprinkler system</td>
</tr>
<tr>
<td>In Group I-2 occupancies, laboratories not classified as Group H</td>
<td>1 hour and provide automatic sprinkler system</td>
</tr>
<tr>
<td><strong>In ambulatory care facilities, laboratories not classified as</strong></td>
<td><strong>1 hour and provide automatic sprinkler system</strong></td>
</tr>
<tr>
<td><strong>Group H</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Laundry rooms over 100 square feet</strong></td>
<td><strong>1 hour or provide automatic sprinkler system</strong></td>
</tr>
<tr>
<td><strong>In Group I-2, laundry rooms over 100 square feet</strong></td>
<td><strong>1 hour</strong></td>
</tr>
<tr>
<td><strong>Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces</strong></td>
<td><strong>1 hour</strong></td>
</tr>
<tr>
<td><strong>In Group I-2, physical plant maintenance shops</strong></td>
<td><strong>1 hour</strong></td>
</tr>
<tr>
<td><strong>In ambulatory care facilities or Group I-2 occupancies, waste and linen collection rooms with containers that have an aggregate volume of 10 cubic feet or greater</strong></td>
<td><strong>1 hour</strong></td>
</tr>
<tr>
<td><strong>In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet</strong></td>
<td><strong>1 hour or provide automatic sprinkler system</strong></td>
</tr>
<tr>
<td><strong>In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than 100 square feet</strong></td>
<td><strong>1 hour</strong></td>
</tr>
<tr>
<td><strong>Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons for flooded lead-acid, nickel cadmium or VRLA, or more than 1,000 pounds for lithium-ion and lithium metal polymer used for facility standby power, emergency power or uninterruptable power supplies</strong></td>
<td><strong>1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.</strong></td>
</tr>
<tr>
<td><strong>Capacitor energy storage systems having an energy capacity greater than the threshold quantity specified in Section 612.1 of the International Fire Code.</strong></td>
<td><strong>1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.</strong></td>
</tr>
</tbody>
</table>

For SI: 1 square foot = 0.0929 m², 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L, 1 cubic foot = 0.0283 m³.

**Reference standards type:** This reference standard is new to the ICC Code Books

**Add new standard(s) as follows:**

**UL 1741 - 2015** Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources

**UL 1973** Standard for Batteries for Use in Light Electric Rail (LER) Applications and Stationary Applications

**UL 9540** Standard for Energy Storage Systems and Equipment

**Reason:** The U.S. Department of Energy is working with a wide range of stakeholders to encourage the development of large scale electrical energy storage systems (ESS). ESS are needed because the amount of electricity that can be generated on the electrical grid is relatively fixed over short periods of time, although demand for electricity fluctuates throughout the day. Developing technology to store electrical energy so it can be available to meet demand is being actively pursued with a number of energy storage technologies, including battery storage systems and electrochemical capacitors, among others. The upcoming widespread installation of large ESS systems into existing buildings poses significant hazards to occupants and emergency responders due to the nature of the technologies involved and the large amounts energy being stored. These systems are largely unregulated by the IBC and IFC, especially capacitors energy storage systems (CESS) which are just largely under development have the potential to be a significant energy storage source by 2018.

This proposal, which is a companion proposal to the FCAC stationary storage battery system proposal, establishes basic protection requirements for CESS. Without these requirements, these systems will be virtually unregulated by 2018 fire and building codes. This proposal includes safety measures that are similar to the FCAC proposed battery storage system requirements, with some modifications as noted below.

1. Revisions are proposed to IBC Section 307.1.1 and Table 509.1 to allow CESS under the MAQ to be allowed in incidental use areas of buildings, and to not have to comply with hazardous material requirements, which is consistent with current battery storage system requirements. The intent of this proposal is to support the DOE energy storage initiative by allowing significant quantities of capacitors in incidental use areas of buildings, with a reasonable number of protection measures in place to protect occupants and emergency responders in the event of a fire or other incident originating from, or impinging on the CESS.

2. Construction and operational permits are required for CESS systems above the threshold amounts in Section 612.1.

3. The protection concepts in Sections 612.1.1 though 612.2.4 are based FCAC proposed battery storage system requirements.
4. Section 612.3 includes a MAQ of 600 KWh for all capacitor technologies. Installations in excess of this amount cannot be located in incidental use areas of buildings and must be located in Group H occupancies.

5. Sections 612.4 to 612.6 are based on FCAC proposed battery storage system requirements.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

**Public Hearing Results**

<table>
<thead>
<tr>
<th>Committee Action</th>
<th>Disapproved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Committee Reason</td>
<td>The committee was in favor of the concept presented by this proposal however the proposal needs more refinement regarding a variety of issues such as the separation requirements.</td>
</tr>
</tbody>
</table>

| Assembly Action          | None |

**Individual Consideration Agenda**

**Public Comment 1:**

Proponent : Michael O'Brian representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Replace Proposal as Follows:

2015 International Fire Code

105.7.4 Capacitor energy storage systems. A permit is required to install capacitor energy storage systems regulated by Section 612.

**SECTION 202 DEFINITIONS**

**CAPACITOR ENERGY STORAGE SYSTEM.** A stationary, rechargeable energy storage system consisting of capacitors, chargers, controls, and associated electrical equipment designed to provide electrical power to a building or facility. The system is typically used to provide standby or emergency power, an uninterruptable power supply, load shedding, load sharing or similar capabilities.

**Pre-engineered capacitor energy storage system.** A capacitor energy storage system consisting of capacitors, an energy management system, components and modules that are produced in a factory, designed to comprise the system when assembled and shipped to the job site for assembly.

**Prepackaged capacitor energy storage system.** A capacitor energy storage system consisting of capacitors, an energy management system, components and modules that is factory assembled and then shipped as a complete unit for installation at the job site.
CAPACITOR ARRAY. An arrangement of individual capacitor modules in close proximity to each other, mounted on storage racks or in cabinets or other enclosures.

SECTION 612 CAPACITOR ENERGY STORAGE SYSTEMS

612.1 Scope. Capacitor energy storage systems having capacities exceeding 3 KWh (10.8 Mega joules) shall comply with this section.

Exception: Capacitors regulated by NFPA 70, Chapter 460 and capacitors included as a component part of other listed electrical equipment are not required to comply with this section.

612.1.1 Permits. Permits shall be obtained for the installation of capacitor energy storage systems in accordance with Section 105.7.4.

612.2 Location and construction. Rooms and areas containing capacitor energy storage systems shall be designed, located and constructed in accordance with this section.

612.2.1 Location. Capacitor energy storage systems shall not be located in areas where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, or where the floor level is more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge.

612.2.2 Separation. Rooms containing capacitor energy storage systems shall be separated from the following occupancies by fire barriers or horizontal assemblies, or both, constructed in accordance with the International Building Code.


612.2.3 Capacitor arrays. Capacitor energy storage systems shall be segregated into arrays not exceeding 50 KWh (180 Mega joules) each. Each array shall be spaced a minimum three feet (914 mm) from other arrays and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exception: Capacitor energy storage systems in noncombustible containers located outdoors shall not be required to be spaced three feet (914 mm) from the container walls.

612.2.4 Signage. Approved signs shall be provided on doors or in locations adjacent to the entrances to capacitor energy storage system rooms and shall include the following or equivalent.

1. CAPACITOR ENERGY STORAGE ROOM
2. THIS ROOM CONTAINS ENERGIZED ELECTRICAL CIRCUITS
3. An identification of the type of capacitors present and the potential hazards associated with the capacitor type.

612.2.5 Electrical disconnects. Where the capacitor energy storage system disconnecting means is not within sight of the main service disconnecting means, placards or directories shall be installed at the location of the main service disconnecting means identifying the location of the capacitor energy storage system disconnecting means in accordance with NFPA 70.

612.2.6 Outdoor installations. Capacitor energy systems located outdoors shall comply with this Section, in addition to all applicable requirements of Section 608. Installations in outdoor enclosures or containers which can be occupied for servicing, testing, maintenance and other functions shall be treated as capacitor storage rooms.

Exception: Capacitor arrays in noncombustible containers shall not be required to be spaced three feet (914 mm) from the container walls.

612.2.6.1 Separation. Capacitor energy systems located outdoors shall be separated by a minimum five feet (1524 mm) from the following:

1. Lot lines
2. Public ways
3. Buildings
4. Stored combustible materials
5. Hazardous materials
6. High-piled stock
7. Other exposure hazards

Exception: The fire code official is authorized to approve smaller separation distances if large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress from adjacent buildings, or adversely impact adjacent stored materials or structures.

612.2.6.2 Means of egress. Capacitor energy storage systems located outdoors shall be separated from any means of egress as required by the fire code official to ensure safe egress under fire conditions, but in no case less than 10 feet (3048
Exception: The fire code official is authorized to approve smaller separation distances if large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress.

612.2.6.3 Security of outdoor areas. Outdoor areas in which capacitor energy storage systems are located shall be secured against unauthorized entry and safeguarded in an approved manner.

612.2.6.4 Walk-in units. Where a capacitor energy storage system includes an outer enclosure, the unit shall only be entered for inspection, maintenance and repair of batteries and electronics, and shall not be occupied for other purposes.

612.3 Maximum allowable quantities. Fire areas within buildings containing capacitor energy storage systems that exceed 600 kWh of energy capacity shall comply with all applicable High Hazard Group H occupancy requirements in this Code and the International Building Code.

612.4 Capacitors and equipment. The design and installation of capacitor energy storage systems, and related equipment shall comply with this section.

612.4.1 Listing. Capacitors and capacitor energy storage systems shall comply with the following:
1. Capacitors shall be listed in accordance with UL 1973.
2. Prepackaged and pre-engineered stationary capacitor energy storage systems shall be listed in accordance with UL 9540.

612.4.2 Prepackaged and pre-engineered systems. In addition to other applicable requirements of this code, prepackaged and pre-engineered capacitor energy storage systems shall be installed in accordance with their listing and the manufacturer's instructions.

612.4.3 Energy management system. An approved energy management system shall be provided for monitoring and balancing capacitor voltages, currents and temperatures within the manufacturer's specifications. The system shall transmit an alarm signal to an approved location if potentially hazardous temperatures or other conditions such as short circuits, overvoltage or under voltage are detected.

612.4.4 Capacitor chargers. Capacitor chargers shall be compatible with the capacitor manufacturer's electrical ratings and charging specifications. Capacitor chargers shall be listed and labeled in accordance with the UL 1564 or provided as part of a listed pre-engineered or prepackaged capacitor energy storage system.

612.4.5 Toxic and highly toxic gas. Capacitor energy storage systems that have the potential to release toxic and highly toxic materials during charging, discharging and normal use conditions shall comply with Chapter 60.

612.5 Detection and protection systems. Fire suppression and smoke detection systems shall be provided in capacitor energy storage system rooms in accordance with this section.

612.5.1 Fire suppression systems. Rooms containing capacitor energy storage systems shall be equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1. Commodity classifications for specific capacitor technologies shall be in accordance with Chapter 5 of NFPA 13. If the capacitor types are not addressed in Chapter 5 of NFPA 13, the fire code official is authorized to approve the fire suppression system based on full scale fire and fault condition testing conducted by an approved laboratory.

612.5.1.1 Alternative suppression systems. Capacitor energy storage systems that utilize water reactive materials shall be protected by an approved alternative automatic fire-extinguishing system in accordance with Section 904. The system shall be listed for protecting the type, arrangement and quantities of capacitors in the room. The fire code official shall be permitted to approve the alternate fire suppression system based on full scale fire and fault condition testing conducted by an approved laboratory.

612.5.2 Smoke detection system. An approved automatic smoke detection system shall be installed in rooms containing capacitor energy storage systems in accordance with Section 907.2.

612.5.3 Ventilation. Where capacitors release flammable gases during normal operating conditions ventilation of rooms containing capacitor energy storage systems shall be provided in accordance with the International Mechanical Code and the following:
1. The ventilation system shall be designed to limit the maximum concentration of flammable gas to 25% of the lower flammability limit, or
2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute (cfm) per square foot [0.00508 m³/(s • m²)] of floor area, but not less than 150 cfm (4 m³/min).
3. The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor
density greater than air and across all parts of the ceiling for gases having a vapor density less than air.

612.5.3.1 Supervision. Required mechanical ventilation systems for rooms containing capacitor energy storage systems shall
be supervised by an approved central station, proprietary or remote station service or shall initiate an audible and visible signal
at an approved constantly attended on-site location.

612.5.4 Spill control and neutralization. Where capacitors contain liquid electrolyte, approved methods and materials shall
be provided for the control and neutralization of spills of electrolyte or other hazardous materials in areas containing stationary
storage batteries as follows:
For capacitors with free-flowing electrolyte, the method and materials shall be capable of neutralizing a spill of the total capacity
from the largest cell or block to a pH between 5.0 and 9.0.
For capacitors with immobilized electrolyte, the method and material shall be capable of neutralizing a spill of 3.0 percent of the
capacity of the largest cell or block in the room to a pH between 5.0 and 9.0.

612.6 Testing, maintenance and repairs. Capacitors and associated equipment and systems shall be tested and
maintained in accordance with the manufacturer’s instructions. Any capacitors or system components used to replace existing
units shall be compatible with the capacitor charger, energy management systems, other capacitors, and other safety systems.
Introducing different capacitors technologies into the capacitor energy storage system shall be treated as a new installation and
require approval by the fire code official before the replacements are introduced into service.

907.2.24 Capacitor energy storage systems. An automatic smoke detection system shall be installed in areas containing
capacitor energy storage systems as required by Section 612.

2015 International Building Code

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles hazardous materials as described in one or
more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly
resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas
conform to the requirements of Section 416 and the International Fire Code.

2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to
the International Fire Code.

3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or
equipment.

4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed
systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all
other areas of the building by 1-hour fire barriers constructed in accordance with Section 707 or 1-hour horizontal
assemblies constructed in accordance with Section 711, or both.

5. Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).


7. Refrigeration systems.

8. The storage or utilization of materials for agricultural purposes on the premises.

9. Stationary batteries utilized for facility emergency power, uninterruptable power supply or telecommunication facilities,
provided that the batteries are provided with safety venting caps and ventilation is provided in accordance with the
International Mechanical Code.

10. Corrosive personal or household products in their original packaging used in retail display.

11. Commonly used corrosive building materials.

12. Buildings and structures occupied for aerosol storage shall be classified as Group S-1, provided that such buildings
conform to the requirements of the International Fire Code.

13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in
quantities not exceeding the maximum allowable quantity per control area in Group M or S occupancies complying with
Section 414.2.5.

14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial
explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements
prescribed in the International Fire Code.

15. Capacitor energy storage systems in accordance with the International Fire Code.

Commenter’s Reason: At the Code Action Hearing we advised the committee that the proposal needed some additional
work to properly address this new energy storage system technology. Per the committee reason statement they were in favor of
the concept presented by this proposal but also recognized that the proposal needed more refinement regarding a
variety of issues such as the separation requirements.
In this public comment we addressed the concerns with this proposal by retaining the basic protection concept used for other
energy storage systems in this code, while eliminating unnecessary requirements which included, among other things, the
operational permit (dropped in all ESS system proposals), construction documents, hazard mitigation analysis and acceptance
criteria, and occupied work area criteria.
In addition to these changes the threshold quantity in Section 612.1 was reduced to 3 KWh in recognition of the potential
severity of a fire event involving current capacitor technologies, which often contain highly flammable Acetonitrile compounds.
This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC
Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and
hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban
interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference
calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the
committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports
are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)
Proponent: Michael O'Brian representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code

Add new definition as follows:

SECTION 202 DEFINITIONS

[BF] MEMBRANE-PENETRATION FIRESTOP SYSTEM. An assemblage consisting of a fire-resistance-rated floor-ceiling, roof-ceiling or wall assembly, one or more penetrating items installed into or passing through the breach in one side of the assembly and the materials or devices, or both, installed to resist the spread of fire into the assembly for a prescribed period of time.

SECTION 202 DEFINITIONS

[BF] OPENING PROTECTIVE. A fire door assembly, fire shutter assembly, fire window assembly or glass-block assembly in a fire-resistance-rated wall or partition.

SECTION 202 DEFINITIONS

SMOKE PARTITION. A wall assembly that extends from the top of the foundation or floor below to the underside of the floor or roof sheathing, deck or slab above or to the underside of the ceiling above where the ceiling membrane is constructed to limit the transfer of smoke.

SECTION 202 DEFINITIONS

[BF] THROUGH-PENETRATION FIRESTOP SYSTEM. An assemblage consisting of a fire-resistance-rated floor, floor-ceiling or wall assembly, one or more penetrating items passing through the breaches in both sides of the assembly and the materials or devices, or both, installed to resist the spread of fire through the assembly for a prescribed period of time.

SECTION 701 GENERAL

Revise as follows:

701.1 Scope. The provisions of this chapter shall govern the inspection and maintenance of the materials, systems and assemblies used for structural fire resistance and fire-resistance-rated construction separation of adjacent spaces and smoke resistant construction to safeguard against the spread of fire and smoke within a building and the spread of fire to or from buildings. New buildings shall comply with the International Building Code.

Add new text as follows:

701.3 Smoke barriers. The fire-resistance rating and smoke resistant characteristics of smoke barriers shall be maintained.

Delete without substitution:

703.1.3 Fire walls, fire barriers and fire partitions. Required fire walls, fire barriers and fire partitions shall be maintained to prevent the passage of fire. Openings protected with approved doors or fire dampers shall be maintained in accordance with NFPA 80.
703.1.2 Smoke barriers and smoke partitions. Required smoke barriers and smoke partitions shall be maintained to prevent the passage of smoke. Openings protected with approved smoke barrier doors or smoke dampers shall be maintained in accordance with NFPA 105.

Add new text as follows:

701.4 Smoke partitions. The smoke resistant characteristics of smoke partitions shall be maintained.

701.5 Maintaining protection. Materials, systems and devices used to repair or protect breaches and openings in fire-resistance-rated construction and smoke resistant construction shall be maintained in accordance with Sections 703 through 707.

Revise as follows:

703.1.6 Maintenance Owner’s responsibility. The required fire-resistance rating fire-resistance-rated fire-resistance-rated and smoke-resistant construction, including, but not limited to, walls, firestops, shaft enclosures, partitions, smoke barriers, floors, fire-resistive coatings and sprayed fire resistant materials applied to structural members and fire resistant joint systems, shall be maintained. Such elements the construction included in Sections 703 through 707 shall be visually inspected by the owner annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained. Where concealed, such elements shall not be required to be visually inspected by the owner unless the concealed space is accessible by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space. Openings made therein for the passage of pipes, electrical conduit, wires, ducts, air transfer openings and holes made for any reason shall be protected with approved methods capable of resisting the passage of smoke and fire. Openings through fire-resistance-rated assemblies shall be protected by self- or automatic closing doors of approved construction meeting the fire protection requirements for the assembly.

701.7 Unsafe conditions. Where any components in this chapter are not maintained and do not function as intended or do not have the fire resistance or the resistance to the passage of smoke required by the code under which the building was constructed, remodeled or altered, such component(s) or portion thereof shall be deemed an unsafe condition, in accordance with Section 110.1.1. Components or portions thereof determined to be unsafe shall be repaired or replaced to conform to that code under which the building was constructed, remodeled, altered or this chapter, as deemed appropriate by the fire code official.

Where the extent of the conditions of components is such that any building, structure or portion thereof presents an imminent danger to the occupants of the building, structure or portion thereof, the fire code official shall act in accordance with Section 110.2.

SECTION 702 DEFINITIONS

702.1 Definitions. The following terms are defined in Chapter 2:
DRAFTSTOP.
FIRE-RESISTANT JOINT SYSTEM-FIREBLOCKING.
FIRE-RESISTANT JOINT SYSTEM.
MEMBRANE-PENETRATION FIRESTOP SYSTEM.
OPENING PROTECTIVE.
SMOKE BARRIER.
SMOKE PARTITION.
FIREBLOCKING THROUGH-PENETRATION FIRESTOP SYSTEM.

SECTION 703 FIRE-RESISTANCE-RATED CONSTRUCTION PENETRATIONS

Add new text as follows:

703.1 Maintaining protection. Materials and firestop systems used to protect membrane- and through-penetrations in fire-resistance-rated construction and smoke resistant construction shall be maintained. The materials and firestop systems shall be securely attached to or bonded to the construction being penetrated with no openings visible through or into the cavity of the construction.

703.2 Unprotected penetrations. All unprotected penetrations in fire-resistance-rated construction and smoke resistant construction shall be protected as required in the International Building Code.

SECTION 704 JOINTS AND VOIDS

704.1 Maintaining protection. Where required when the building was originally constructed, materials and systems used to protect joints and voids installed in the following locations shall be maintained. The materials and systems shall be securely attached to or bonded to the adjacent construction, without openings visible through the construction.

1. Joints in or between fire-resistance-rated walls, floors or floor/ceiling assemblies and roof or roof/ceiling assemblies.
2. Joints in smoke barriers.
3. Voids at the intersection of a horizontal floor assembly and an exterior curtain wall.
4. Voids at the intersection of a horizontal smoke barrier and an exterior curtain wall.
5. Voids at the intersection of a nonfire-resistance-rated floor assembly and an exterior curtain wall.
6. Voids at the intersection of a vertical fire barrier and an exterior curtain wall.
7. Voids at the intersection of a vertical fire barrier and a nonfire-resistance-rated roof assembly.

**Exception:** Unprotected joints and voids do not need to be protected where such joints and voids were not required to be protected when the building was originally constructed.

**SECTION 705 DOOR AND WINDOW OPENINGS**

**705.1 General.** Openings through fire-resistance-rated assemblies shall be protected by self- or automatic-closing fire doors, fire windows or floor fire doors capable of resisting the passage of fire. Openings through smoke barriers shall be protected by fire windows or by self- or automatic-closing fire doors capable of resisting the passage of fire and smoke. Openings through smoke partitions shall be protected by windows or self- or automatic-closing doors capable of resisting the passage of smoke.

Revise as follows:

**703.2 705.2 Opening protectives Inspection and maintenance.** Opening protectives in fire-resistance-rated assemblies shall be inspected and maintained in an operative condition in accordance with NFPA 80. Where allowed by the Opening protectives in fire code official smoke barriers, the application of field-applied labels associated shall be inspected and maintained in accordance with the maintenance of opening protectives. NFPA 80 and 105. Openings in smoke partitions shall follow the requirements of the approved third-party certification organization accredited for listing the opening protective be inspected and maintained in accordance with NFPA 105. Fire doors and smoke barrier smoke and draft control doors shall not be blocked or obstructed, or otherwise made inoperable. Fusible links shall be replaced promptly whenever fused or damaged. Fire door assemblies Opening protectives and smoke and draft control doors shall not be modified.

Add new text as follows:

**705.2.1 Labeling requirements.** Components of the fire door and fire window assemblies, floor fire doors, and smoke and draft control doors shall be listed and labeled by an approved agency. Where approved by the fire code official, the application of field-applied labels associated with the maintenance of opening protectives shall follow the requirements of the approved third-party certification organization accredited for listing the opening protective.

Revise as follows:

**703.2.2 705.2.2 Signs.** Where required by the fire code official, a sign shall be permanently displayed on or near each fire door in letters not less than 1 inch (25 mm) high to read as follows:
1. For doors designed to be kept normally open: FIRE DOOR—DO NOT BLOCK.
2. For doors designed to be kept normally closed: FIRE DOOR—KEEP CLOSED.

**703.2.3 705.2.3 Hold-open devices and closers.** No change to text.

**703.2.4 705.2.4 Door operation.** Swinging fire doors shall close from the full-open position and latch automatically. The door closer shall exert enough force to close and latch the door from any partially open position.

**704.2 705.2.5 Opening protectives Smoke and heat activated doors.** Where openings are required to be protected, opening protectives smoke activated doors shall be maintained self-closing or automatic closing by smoke detection. Existing fusible-link-type automatic door-closing devices are permitted if the fusible link rating does not exceed 135°F (57°C).

**703.4 705.2.6 Testing.** Horizontal and vertical sliding and rolling fire doors shall be inspected and tested annually to confirm proper operation and full closure. Records of inspections and testing shall be maintained.

Add new text as follows:

**SECTION 706 DUCT AND AIR TRANSFER OPENINGS**

**706.1 General.** Openings for ducts and air transfer openings shall be protected with dampers or other approved methods capable of resisting the passage of fire and smoke.

**706.2 Maintaining protection.** Dampers protecting ducts and air transfer openings shall be inspected and maintained in accordance with NFPA 80 and 105 and installed in accordance with the manufacturer's instructions. All other products or materials used to protect the openings for ducts and air transfer openings shall be securely attached to or bonded to the construction containing the duct or air transfer opening, without openings visible through or into the cavity of the construction. Any damaged products or materials protecting duct and air transfer openings shall be repaired, restored or replaced.

**706.3 Unprotected openings.** Unprotected duct and air transfer openings in fire-resistance-rated and smoke resistant
construction shall be protected so as to comply with requirements that were in effect when the building was constructed.

Revise as follows:

**SECTION 707 CONCEALED SPACES**

707.1 Fireblocking and draftstopping. No change to text.

Delete without substitution:

**SECTION 704 FLOOR OPENINGS AND SHAFTS**

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 11. New floor openings in existing buildings shall comply with the International Building Code.

Reason: This proposal was developed by a FCAC working group of interested stakeholders, and is primarily a reorganization of Chapter 7 requirements. It also includes new requirements on how fire and smoke protection features are to be maintained, replaced or repaired. The changes are needed because the current requirements are not arranged in a logical order, skip around between inspection, maintenance and field testing, and are not complete.

The proposal starts with new definitions that are not always understood by code users but are needed to properly enforce this code section. The MEMBRANE-PENETRATION FIRESTOP SYSTEM and THROUGH-PENETRATION FIRESTOP SYSTEM definitions are already in the 2015 IBC and the OPENING PROTECTIVE definition was added to the 2018 IBC as a successful Group A change. SMOKE BARRIER is already defined in the IFC. The SMOKE PARTITION definition is new and is based on IBC Section 710.3 and 710.4 requirements.

Chapter 7 is now organized into General (701), Definitions (702), Penetrations (703), Joints and Voids (704), Door and Window Openings (705), Ducts and Air Transfer Openings (706) and Concealed Spaces (707) sections, which incorporate terminology used in the International Building Code.

The concept behind the rewrite is that the General requirements in Section 701 include administrative provisions that were currently in the code, and require fire-resistance-rated construction, smoke barriers, and smoke partitions to be maintained.

The code mandated means for protecting penetrations, voids and openings in these assemblies, including penetration protection, joint protection, opening protective, duct and air transfer opening protection, and concealed space protection are covered in Section 703 through 707.

The working group felt that there was no need to retain the Section 704 FLOOR OPENINGS AND SHAFT requirements since these only provided a pointer to Chapter 11 existing building requirements for vertical openings. It was noted that this Chapter did not include pointers to the other fire and smoke resistant construction requirements in Chapter 11. Section 704.2 was retained and moved to the Opening Protective section.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Cost Impact: Will not increase the cost of construction
These are maintenance and repair provisions so it does not increase construction cost. However, it may result in an increased cost of maintaining and repairing existing construction.

**Public Hearing Results**

**Committee Action:** Disapproved

**Committee Reason:** The committee had concern about the mandate for a requirement that has no connection to maintenance. In addition, there was objection of the use of the term smoke resistant construction instead of using the terms smoke partitions and smoke barriers.
Individual Consideration Agenda

Public Comment 1:

Proponent: William Koffel, representing Firestop Contractors International Association (wkoffel@koffel.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

703.1 Maintaining protection. Materials and firestop systems used to protect membrane- and through-penetrations in fire-resistance-rated construction and construction installed to resist the passage of smoke resistant construction shall be maintained. The materials and firestop systems shall be securely attached to or bonded to the construction being penetrated with no openings visible through or into the cavity of the construction. Where the system design number is known, the system shall be inspected to the listing criteria and manufacturer’s installation instruction.

Commenter’s Reason: The proposed change coordinates with the IBC for those systems for which the design number is known. If the owner cannot produce the design number, the base inspection criteria would still apply, inspecting to make sure the system is properly secured and inspecting for visible openings through the system or into the cavity.

Public Comment 2:

Proponent: William Koffel, representing Firestop Contractors International Association (wkoffel@koffel.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

701.6 Owner’s responsibility. Required The owner shall maintain an inventory of all required fire-resistance-rated and smoke-resistant construction, and the construction included in Sections 703 through 707 and such construction shall be visually inspected by the owner annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained. Where concealed, such elements shall not be required to be visually inspected by the owner unless the concealed space is accessible by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space.

Commenter’s Reason: During the CAH, the FCIA proposed that the owner maintain drawings that identify the location of the construction that is required to be inspected by this Section. There was opposition to the word drawing due to a concern that in some states the drawings may need to be prepared by a registered design professional. The use of the word “inventory” allows for the information to be provided in multiple formats: lists, spreadsheets, drawings, or some other media that denotes where the construction is in the building. Maintaining an inventory is critical to the owner, the fire code official, and anyone who may be providing the inspection service. How do any of these parties know what needs to be inspected and document that the inspections have been performed (as required by this Section) if an inventory of such construction is not maintained and available?

Public Comment 3:

Proponent: Michael O’Brian representing Fire Code Action Committee(fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

701.1 Scope. The provisions of this chapter shall govern the inspection and maintenance of the materials, systems and assemblies used for structural fire resistance, fire-resistance-rated construction separation of adjacent spaces and construction installed to resist the passage of smoke resistant construction to safeguard against the spread of fire and smoke within a building and the spread of fire to or from buildings. New buildings shall comply with the International Building Code.

701.5 Maintaining protection. Materials, systems and devices used to repair or protect breaches and openings in fire-resistance-rated construction and construction installed to resist the passage of smoke resistant construction shall be...
maintained in accordance with Sections 703 through 707.

701.6 Owner's responsibility. Required fire-resistance-rated and smoke-resistant construction, construction installed to resist the passage of smoke, and the construction included in Sections 703 through 707 shall be visually inspected by the owner annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained. Where concealed, such elements shall not be required to be visually inspected by the owner unless the concealed space is accessible by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space.

703.1 Maintaining protection. Materials and firestop systems used to protect membrane- and through-penetrations in fire-resistance-rated construction and smoke-resistant construction installed to resist the passage of smoke shall be maintained. The materials and firestop systems shall be securely attached to or bonded to the construction being penetrated with no openings visible through or into the cavity of the construction.

703.2 Unprotected penetrations. All unprotected penetrations in fire-resistance-rated construction and smoke-resistant in construction installed to resist the passage of smoke shall be protected as required in the International Building Code. Unprotected joints and voids, do not need to be protected where such joints and voids were not required to be protected when the building was originally constructed.

703.4.1 Maintaining protection. Where required when the building was originally constructed, materials and systems used to protect joints and voids installed in the following locations shall be maintained. The materials and systems shall be securely attached to or bonded to the adjacent construction, without openings visible through the construction.

- Joints in or between fire-resistance-rated walls, floors or floor/ceiling assemblies and roof or roof/ceiling assemblies.
- Joints in smoke barriers.
- Voids at the intersection of a horizontal floor assembly and an exterior curtain wall.
- Voids at the intersection of a horizontal smoke barrier and an exterior curtain wall.
- Voids at the intersection of a nonfire-resistance-rated floor assembly and an exterior curtain wall.
- Voids at the intersection of a vertical fire barrier and an exterior curtain wall.
- Voids at the intersection of a vertical fire barrier and a nonfire-resistance-rated roof assembly.

Exception: Unprotected joints and voids, do not need to be protected where such joints and voids were not required to be protected when the building was originally constructed.

705.1 General. Openings through fire-resistant-rated assemblies, fire-resistance-rated smoke barriers, and smoke partitions shall be protected by self- or automatic closing fire doors, fire windows or floor fire doors capable of resisting the passage of fire. Openings through smoke barriers shall be protected by fire windows or by self- or automatic closing fire doors capable of resisting the passage of fire inspected and smoke. Openings through smoke partitions shall be protected by windows or self- or automatic closing doors capable of resisting the passage of smoke maintained in accordance with this section.

705.2 Inspection and maintenance. Opening protectives in fire-resistance-rated assemblies shall be inspected and maintained in accordance with NFPA 80. Opening protectives in smoke barriers shall be inspected and maintained in accordance with NFPA 80 and NFPA 105. Openings in smoke partitions shall be inspected and maintained in accordance with NFPA 105. Fire doors and smoke and draft control doors shall not be blocked or obstructed, or otherwise made inoperable. Fusible links shall be replaced promptly whenever fused or damaged. Opening protectives and smoke and draft control doors shall not be modified.

705.2.1 Labeling requirements. Components of the fire door and fire window assemblies, floor fire doors, and smoke and draft control doors shall be listed and labeled by an approved agency. Where approved by the fire code official, the application of field-applied labels associated with the maintenance of opening protectives shall follow the requirements of the approved third-party certification organization accredited for listing the opening protective.

705.2.4 Door operation. Swinging fire doors shall close from the full-open position and latch automatically. The door closer shall exert enough force to close and latch the door from any partially open position.

705.2.5 Smoke and heat activated doors. Where openings are required to be protected, smoke activated doors shall be maintained self-closing to self-close or automatic closing by automatically close upon detection of smoke detection. Existing fusible-link-type automatic door-closing devices are permitted if the fusible link rating does not exceed 135°F (57°C).

SECTION 706 DUCT AND AIR TRANSFER OPENINGS

706.1 General. Openings for ducts and air transfer openings shall be protected with dampers or other approved methods capable of resisting the passage of fire and smoke.

706.2.1 Maintaining protection. Dampers protecting ducts and air transfer openings shall be inspected and maintained in accordance with NFPA 80 and 105 and installed in accordance with the manufacturer's instructions. All other products or
materials used to protect the openings for ducts and air transfer openings shall be securely attached to or bonded to the construction containing the duct or air transfer opening, without openings visible through or into the cavity of the construction. Any damaged products or materials protecting duct and air transfer openings shall be repaired, restored or replaced.

**706.3 Unprotected openings.** Unprotected duct and air transfer openings in fire-resistance-rated construction and smoke resistant construction installed to resist the passage of smoke shall be protected so as to comply with requirements that were in effect when the building was constructed.

**Commenter's Reason:** This public comment addresses the committee's concerns as follows:

1. It was not the intent to introduce new construction requirements into the IFC. The following sections were revised for clarification.

   - Proposed Section 703.2 originally required unprotected penetrations in assemblies to be protected as required in the IBC (for new construction). This was changed to require these openings to be protected with "approved methods", which is consistent with Section 703.1 of the 2015 IFC.
   - Section 704.1 was revised to remove the term "installed".
   - Section 705.1 was revised to clarify that opening protective are only required to be inspected and maintained.
   - Section 705.2.1 was revised to remove the requirements for fire door and fire window assemblies to be listed and labeled, which was not in the 2015 IFC. Labeling of these products is covered by the NFPA 80 inspection requirements referenced in Section 705.2.
   - Section 705.2.5 was revised to clarify that existing smoke and heat activated doors need to be maintained.
   - Section 706.1 was not considered necessary and was removed.
   - Section 706.2 (now 706.1) was revised to remove an unnecessary reference to installation in accordance with the manufacturer's instructions.

2. The committee suggested that the term "smoke resistant construction" be replaced with references to smoke barriers and smoke partitions. This concern was addressed by substituting the phrase "construction installed to resist the passage of smoke" in lieu of "smoke resistant construction" where it appeared in the proposal. We did not use the phrase "smoke partitions and smoke barriers" because other protection methods including firestop systems, joint systems and smoke and draft control doors also resist the passage of smoke. See Sections 701.1, 701.5, 701.6, 703.1, 703.2 and 706.3 for these revisions.

3. In addition to the committee's concerns, Section 705.2.4 was modified to only require swinging fire doors to latch when closing from the full open position, which is consistent with NFPA 80, Section 5.2.3.5.2.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

**Public Comment 4:**

**Proponent** : Steven Orlowski, BOMA International, representing Building Owners and Managers Association International (sorlowski@boma.org) requests Approve as Modified by this Public Comment.

**Modify as Follows:**

**2015 International Fire Code**

**705.2.5 Smoke and heat activated doors.** Where existing openings are required to be protected by smoke activated closing devices, doors shall be maintained self-closing or automatic closing by automatically close upon the detection of smoke detection. Existing fusible-link-type automatic door-closing devices are permitted if the fusible link rating does not exceed 135°F (57°C).

**703.2 Unprotected penetrations.** All unprotected penetrations in fire-resistance-rated construction and smoke resistant construction shall be protected as required in the International Building Code.

**705.1 General.** Openings. Where required when the building was originally constructed, openings through fire-resistance-rated assemblies, smoke barriers, and smoke partitions shall be protected by self- or automatic closing fire doors, fire windows or floor fire doors capable of resisting the passage of fire. Openings through smoke barriers shall be protected by fire windows or
by self- or automatic-closing fire doors capable of resisting the passage of fire and smoke. Openings through smoke partitions shall be protected by windows or self- or automatic-closing doors capable of resisting the passage of smoke maintained.

705.2.1 Labeling requirements. Components of the fire door and fire window assemblies, floor fire doors, and smoke and draft control doors shall be listed and labeled by an approved agency. Where approved by the fire code official, the application of field-applied labels associated with the maintenance of opening protectives shall follow the requirements of the approved third-party certification organization accredited for listing the opening protective.

706.1 General. Openings. Where required when the building was originally constructed, openings for ducts and air transfer openings shall be protected with dampers or other approved methods capable of resisting the passage of fire and smoke.

Commenter's Reason: During the Committee Action Hearings, the committee raised concerns with the language in the original proposal that appeared to retroactively require additional protection that may not have been required at the time the building was constructed. This proposals adds the clarification to make sure that where opening protections were installed during the original construction, that they will be properly maintained.

F113-16
Committee Action: Disapproved

Assembly Action: None

F114-16
IFC: 701.3 (New).

Proposed Change as Submitted

Proponent: Tony Crimi, International Firestop Council (tcrimi@sympatico.ca)

2015 International Fire Code
Add new text as follows:

701.3 Repair of Penetrations, Joint and Voids Where materials used to protect membrane- and through-penetrations, joints and voids have been damaged, they shall be replaced or repaired with materials and systems that comply with code requirements applicable at the time when the assembly was constructed, remodeled or altered.

Reason: This proposal is intended to compliment the work of the Fire Code Action Committee working group of interested stakeholders that proposed the revision to Chapter 7. The working group has proposed to provide detailed requirements on how fire and smoke protection features are to be maintained and replaced. The changes proposed by the FCAC are needed because the current code requirements are not complete or specific enough to ensure consistent code conformance and enforcement.

However, the proposal submitted by FCAC does not fully address what to do with damaged protection for membrane- and through-penetrations, joints and voids. This proposal completes the work of the FCAC working group by stating what should be done when a penetration or joint seal is discovered to be damaged. Although a damaged seal should ideally be replaced with a firestop system complying with the IBC, this Proposal recognizes that penetrations or joints that were sealed in accordance with previous code editions may not have required the tested systems that are mandated by today's building codes. The wording proposed here continues the allowance to grandfather installed penetration and joint seals when they are damaged, nevertheless requiring them to be repaired to meet the requirements that were applicable when the penetration or joint was last installed, repaired or altered.

Cost Impact: Will not increase the cost of construction

Based on current IFC, this is already required. This proposal provides additional guidance and compliments other proposals on Chapter 7.

Public Hearing Results

Committee Action: Disapproved

Committee Reason: This text is not needed because the subject is already covered in Section 703.1.

Assembly Action: None

Individual Consideration Agenda

Proponent: Tony Crimi, representing International Firestop Council (tcrimi@sympatico.ca) requests Approve as Submitted.

Commenter's Reason: This proposal compliments the work of the Fire Code Action Committee on expanding the maintenance requirements in Chapter 7 of the IFC.

While the current language in IFC 703.1 addresses maintenance of fire-resistance rated construction, it is not very specific. Clearly, the intent of IFC article 703.1 is that when protection of penetrations and joints has been damaged, they need to be repaired, not simply "maintained" in a damaged condition. The language proposed here clarifies that requirement.

This Proposal recognizes that penetrations or joints that were protected in accordance with previous code editions may not have used the types of tested systems that are mandated by today's building codes. Consequently, the wording proposed here continues the allowance to grandfather installed penetration and joint seals when they are damaged, but requires that they be repaired to meet the requirements that were applicable when the penetration or joint protection was installed.
Proposed Change as Submitted

Proponent: Marcelo Hirschler, representing GBH International (gbhint@aol.com)

2015 International Fire Code

Revise as follows:

SECTION 803 INTERIOR WALL AND CEILING FINISH AND TRIM IN EXISTING BUILDINGS

803.1 General. The provisions of this section shall limit the allowable fire performance and smoke development of interior wall and ceiling finishes and interior wall and ceiling trim in existing buildings based on location and occupancy classification. Interior wall and ceiling finishes shall be classified in accordance with Section 803 of the International Building Code. Such materials shall be grouped in accordance with ASTM E 84-NFPA 286, as indicated in Section 803.1.1, or in accordance with NFPA 286-ASTM E84, as indicated in Section 803.1.2.
   * Exceptions:
     1. Materials having a thickness less than 0.036 inch (0.9 mm) applied directly to the surface of walls and ceilings.
     2. Exposed portions of structural members complying with the requirements of buildings of Type IV construction in accordance with the International Building Code shall not be subject to interior finish requirements.

Materials tested in accordance with Section 803.1.1 shall not be required to be tested in accordance with Section 803.1.2.

803.1.1 Classification Interior Wall and Ceiling Finish Materials Tested in accordance with ASTM E 84. NFPA 286. Interior wall and ceiling finish materials shall be grouped in the following classes classified in accordance with their flame spread NFPA 286 and smoke-developed index where tested comply with Section 803.1.1.1. Materials complying with Section 803.1.1.1 shall be considered also to comply with the requirements of Class A in accordance with ASTM E 84 Section 803.1.2.
   * Class A: flame spread index 0-25; smoke-developed index 0-450;
   * Class B: flame spread index 26-75; smoke-developed index 0-450;
   * Class C: flame spread index 76-200; smoke-developed index 0-450.

Exceptions: Materials tested in accordance with NFPA 286. Finishes tested Section 803.1.1 and as indicated in accordance with NFPA 286 shall comply with Section 803.1.2.1 803.1.3 through 803.15. Interior wall and ceiling finish materials tested in accordance with NFPA 286 and meeting the acceptance criteria of Section 803.1.2.1 shall be allowed to be used where a Class A classification in accordance with ASTM E 84 is required.

Add new text as follows:

803.1.3 Interior Wall and Ceiling Finish Materials with Different Requirements The materials indicated in Sections 803.4 through 803.15 shall be tested as indicated in the corresponding sections.

803.2 Stability. Interior finish materials regulated by this chapter shall be applied or otherwise fastened in such a manner that such materials will not readily become detached where subjected to room temperatures of 200°F (93°C) for not less than 30 minutes.
803.3 Interior finish requirements based on occupancy. Interior wall and ceiling finish shall have a flame spread index not greater than that specified in Table 803.3 for the group and location designated. Interior wall and ceiling finish materials tested in accordance with NFPA 286, and meeting the acceptance criteria of Section 803.1.1, shall be used where a Class A classification in accordance with ASTM E84 or UL 723 is required.

### TABLE 803.3

**INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY**

<table>
<thead>
<tr>
<th>GROUP</th>
<th>SPRINKLERED†</th>
<th>NONSPRINKLERED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interior exit stairways and interior exit ramps and exit passageways</td>
<td>Corridors and enclosure for exit access stairways and exit access ramps</td>
</tr>
<tr>
<td>A-1 &amp; A-2</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>A-3, A-4, A-5</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>B, E, M, R-1, R-4</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>F</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>H</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>I-1</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>I-2</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>I-3</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>I-4</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>R-2</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>R-3</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>S</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>U</td>
<td>No Restrictions</td>
<td>No Restrictions</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m²

a. Class C interior finish materials shall be allowed for wainscoting or paneling of not more than 1,000 square feet of applied surface area in the grade lobby where applied directly to a noncombustible base or over furring strips applied to a noncombustible base and fireblocked as required by Section 803.11 of the International Building Code.

b. In exit enclosures of buildings less than three stories in height or other than Group I-3, Class B interior finish for nonsprinklered buildings and Class C for sprinklered buildings shall be permitted.

c. Requirements for rooms and enclosed spaces shall be based upon spaces enclosed by partitions. Where a fire-resistance rating is required for structural elements, the enclosing partitions shall extend from the floor to the ceiling. Partitions that do not comply with this shall be considered as enclosing spaces and the rooms or spaces on both sides shall be considered as one. In determining the applicable requirements for rooms and enclosed spaces, the specific occupancy thereof shall be the governing factor regardless of the group classification of the building or structure.

d. Lobby areas in Group A-1, A-2 and A-3 occupancies shall not be less than Class B materials.

e. Class C interior finish materials shall be allowed in Group A occupancies with an occupant load of 300 persons or less.

f. In places of religious worship, wood used for ornamental purposes, trusses, paneling or chancel furnishing shall be allowed.

g. Class B material is required where the building exceeds two stories.

h. Class C interior finish materials shall be allowed in administrative spaces.

i. Class C interior finish materials shall be allowed in rooms with a capacity of four persons or less.

j. Class B materials shall be allowed as wainscoting extending not more than 48 inches above the finished floor in corridors.

k. Finish materials as provided for in other sections of this code.

l. Applies when the vertical exits, exit passageways, corridors or rooms and spaces are protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

803.4 Fire-retardant coatings. The required flame spread or smoke-developed index of surfaces in existing buildings shall be allowed to be achieved by application of approved fire-retardant coatings, paints or solutions to surfaces having a flame spread index exceeding that allowed. Such applications shall comply with NFPA 703 and the required fire-retardant properties shall be maintained or renewed in accordance with the manufacturer's instructions.

803.5 Textiles **Textile Wall Coverings**. Where used as interior wall or ceiling finish materials, textiles **textile wall coverings**, including materials having woven or nonwoven, napped, tufted, looped or similar surface, shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of one of the following: Section 803.1.1, Section 803.5.1 or Section 803.5.2.

803.5.1 Textile Room corner test for textile wall coverings or ceiling expanded vinyl wall coverings. Textile wall coverings or ceiling expanded vinyl wall coverings shall comply with one meet the criteria or Section 803.5.1.1 when tested in the manner intended for use in accordance with Method B protocol of NFPA 265 using the following:
1. The wall or ceiling covering shall have a Class A flame spread index in accordance with ASTM E 84 or UL 723, and be protected by automatic sprinklers installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. The wall covering shall meet the criteria of Section 803.5.1.1 when tested in the manner intended for use in accordance with NFPA 265 using the product mounting system, including adhesive, of actual use.
3. The wall or ceiling covering shall meet the criteria of Section 803.1.2.1 when tested in accordance with NFPA 286 using the product mounting system, including adhesive, of actual use.

803.5.1.1 Acceptance Criteria for NFPA 265 Method B test protocol: Test Protocol During the Method B protocol, the textile wall covering or expanded vinyl wall covering shall comply with the following:

The interior finish shall comply with the following:
1. During the 40-kW exposure, flames shall not spread to the ceiling.
2. The flame shall not spread to the outer extremities of the samples on the 8-foot by 12-foot (203 by 305 mm) walls.
3. Flashover, as defined in NFPA 265, shall not occur.
4. For newly introduced wall and ceiling coverings, the total smoke released throughout the test shall not exceed 1,000 m².

803.5.2 Newly introduced textile Acceptance criteria for wall and ceiling coverings. Newly introduced textile textile wall and ceiling coverings and expanded vinyl wall and ceiling coverings shall comply have a Class A flame spread index in accordance with one of the following:

1. The wall or ceiling covering shall have a Class A flame spread index in accordance with ASTM E 84 or UL 723, and be protected by automatic sprinklers installed in accordance with Section 903.3.1.1 or 903.3.1.2. Test specimen preparation and mounting shall be in accordance with ASTM E 2404.
2. The wall covering shall meet the criteria of Section 803.5.1.1 when tested in the manner intended for use in accordance with NFPA 265 using the product mounting system (including adhesive) of actual use.
3. The wall or ceiling covering shall meet the criteria of Section 803.1.2.1 when tested in accordance with NFPA 286 using the product mounting system (including adhesive) of actual use.

803.6 Expanded vinyl wall or Textile ceiling coverings. Expanded vinyl wall or Where used as interior ceiling finish materials, textile ceiling coverings, including materials having a woven or nonwoven, napped, tufted, looped or similar surface and carpet or similar textile materials, shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with one the requirements of the following:

1. The wall or ceiling covering shall have a Class A flame spread index in accordance with ASTM E 84 or UL 723, and be protected by automatic sprinklers installed in accordance with Section 903.3.1.1 or 903.3.1.2. Test specimen preparation and mounting shall be in accordance with ASTM E 2404.
2. The wall covering shall meet the criteria of Section 803.5.1.1 when tested in the manner intended for use in accordance with NFPA 265 using the product mounting system (including adhesive) of actual use.
3. The wall or ceiling covering shall meet the criteria of Section 803.1.2.1 when tested in accordance with NFPA 286 using the product mounting system (including adhesive) of actual use.

803.7 Expanded vinyl wall coverings Where used as interior wall finish materials, expanded vinyl wall coverings shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of one of the following: Section 803.1.1, Section 803.5.1 or Section 803.5.2.

803.8 Expanded vinyl ceiling coverings Where used as interior wall finish materials, expanded vinyl ceiling coverings shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of Section 803.1.1 or Section 803.5.2.

Revise as follows:

803.9 High-density polyethylene (HDPE) and polypropylene (PP). Where high-density polyethylene or polypropylene is used as an interior finish it shall comply with Section 803.1.2.803.1.1.

803.10 Site-fabricated stretch systems. Where used as newly installed interior wall or interior ceiling finish materials, site-fabricated stretch systems containing all three components described in the definition in Chapter 2 shall be tested in the manner intended for use, and shall comply with the requirements of Section 803.1.1 or 803.1.2. If the materials are tested in accordance with ASTM E 84 or UL 723, specimen preparation and mounting shall be in accordance with ASTM E 2573.
Foam plastic materials shall not be used as interior wall and ceiling finish unless specifically allowed by Section 803.8.1 or 803.11. Foam plastic materials shall not be used as interior trim unless specifically allowed by Section 803.8.2.

803.8.1 Combustibility. Foam plastics combustibility characteristics. No change to text.

803.8.2 Thermal barrier. No change to text.

804.11 Facings or wood veneers intended to be applied on site over a wood substrate. Facings or veneers intended to be applied on site over a wood substrate shall comply with one of the following:

1. The facing or veneer shall have a Class A, B or C flame spread index and smoke-developed index, based on the requirements of Table 803.3, in accordance with ASTM E 84 or UL 723. Test specimen preparation and mounting shall be in accordance with ASTM E 2404.

2. The facing or veneer shall have a Class A, B or C flame spread index and smoke-developed index, based on the requirements of Table 803.3, in accordance with ASTM E 84 or UL 723. Test specimen preparation and mounting shall be in accordance with ASTM E 2579.

803.13 Laminated products factory-produced with a wood substrate. Laminated products factory-produced with a wood substrate shall comply with one of the following:

1. The laminated product shall meet the criteria of Section 803.1.1 when tested in accordance with NFPA 286 using the product-mounting system, including adhesive, of actual use.

2. The laminated product shall have a Class A, B or C flame spread index and smoke-developed index, based on the requirements of Table 803.3, in accordance with ASTM E 84 or UL 723. Test specimen preparation and mounting shall be in accordance with ASTM E 2579.

803.14 Thickness exemption. Materials having a thickness less than 0.036 inch (0.9 mm) applied directly to the surface of walls or ceilings shall not be required to be tested.

803.15 Heavy timber exemption. Exposed portions of building elements complying with the requirements of Type IV construction in accordance with the International Building Code shall not be subject to interior finish requirements, except in interior exit stairways, interior exit ramps, and exit passageways.

SECTION 804 INTERIOR WALL AND CEILING TRIM AND INTERIOR FLOOR FINISH IN NEW AND EXISTING BUILDINGS

804.1 Interior trim. Material, other than foam plastic, used as interior combustible trim in new and existing buildings shall have minimum Class C flame spread and smoke-developed indices, when tested in accordance with ASTM E 84 or UL 723, as described in Section 803.1.1. Combustible trim, excluding handrails and guardrails, shall not exceed 10 percent of the specific wall or ceiling areas to which it is attached. Material, other than foam plastic, used as interior trim shall comply with Section 804.1.1 or with Section 804.1.2. Foam plastic used as interior trim shall comply with Section 804.2.

804.1.2 Testing in accordance with ASTM E84 or UL 723. Material, other than foam plastic, used as interior trim shall have minimum Class C flame spread and smoke-developed indices, when tested in accordance with ASTM E 84 or UL 723, as described in Section 803.1.2.

Add new text as follows:

804.2 Foam plastic. No change to text.

804.2.1 Density. The minimum density of the interior trim shall be 20 pounds per cubic foot (320 kg/m³).

804.2.2 Thickness. The maximum thickness of the interior trim shall be 1 1/2 inches (12.7 mm) and the maximum width shall be 8 inches (203 mm).

804.2.3 Area limitation. The interior trim shall not constitute more than 10 percent of the specific wall or ceiling area to which it is attached.
is attached.

804.2.4 Flame spread. The flame spread index shall not exceed 75 where tested in accordance with ASTM E 84 or UL 723. The smoke-developed index shall not be limited.

**Exception:** When the interior trim material has been tested as an interior finish in accordance with NFPA 286 and complies with the acceptance criteria in Section 803.1.2.1, it shall not be required to be tested for flame spread index in accordance with ASTM E 84 or UL 723.

Delete without substitution:

803.8.3 Trim. Foam plastic shall be allowed for trim in accordance with Section 804.2.

803.1.2.1 Acceptance criteria for NFPA 286. The interior finish shall comply with the following:

1. During the 40 kW exposure, flames shall not spread to the ceiling.
2. The flame shall not spread to the outer extremity of the sample on any wall or ceiling.
3. Flashover, as defined in NFPA 286, shall not occur.
4. The peak heat release rate throughout the test shall not exceed 800 kW.
5. The total smoke released throughout the test shall not exceed 1,000 m³.

Reference standards type: This is an update to reference standard(s) already in the ICC Code Books

Add new standard(s) as follows:

ASTM E2579 (Standard Practice for Specimen Preparation and Mounting of Wood Products to Assess Surface Burning Characteristics) 2015 - It was added during the 2015 IBC Fire safety hearings

Reason: This reorganizes section 803 to make it follow the testing logic, and makes it consistent with what was approved (by the technical committee and by the membership) in the IBC in proposal FS139-15, with the associated proposals FS132-15 (from David Tyree), FS135-15 and FS136-15.

The requirements of FS136-15 are already included in IFC 2015 (section 803.7). The requirements of FS135-15 are proposed to be added into new section 803.8. The action of FS132-15 is proposed to be moved from the present exception # 2 to 803.1 into a new section 803.15.

The logic accepted by the IBC Fire Safety committee (and the membership at the comment hearings) is that any interior wall and ceiling finish material is permitted to be tested to NFPA 286 and therefore this should come first, as section 803.1.1. This needs to be followed by the criteria for NFPA 286 testing. The section also needs to say that anything that passes NFPA 286 (i.e. the corresponding criteria) is acceptable as a Class A in accordance with ASTM E84 and does not need retesting.

Then comes the section on ASTM E84, with the corresponding criteria, as section 803.1.2.

The next section, 803.1.3, addresses the materials that have other requirements and cannot simply be tested to either one of the above without further details. That includes all of the materials in sections through 803.15.

Textile wall coverings and expanded vinyl wall coverings are covered in 803.5 and 803.7. Therefore the testing in accordance with NFPA 265 needs to move to those sections and that is being done. When dealing with expanded vinyl wall coverings the criteria are not repeated but just reference the textile wall coverings section.

Textile and expanded vinyl ceiling coverings stay as is, just with the section reference changed. The same is true for fire-retardant coatings, HDPE and PP, foam plastics and site-fabricated stretch systems, always without changing requirements.

The section dealing with stability stays as is without change.

The section 803.5.2 dealing with newly introduced textile wall and ceiling coverings is actually a repeat of section 803.5.1. In both cases the requirements are the same: NFPA 286, ASTM E84 or UL 723 Class A and sprinklers or NFPA 265 (for wall coverings only) and the duplicate section is being eliminated. Note that the requirements for smoke in accordance with NFPA 265 apply only to new installations of wall coverings.

Table 803.3 does not need any changes.

Section 803 contained some language on trim which simply pointed to section 804. This is being made clearer so that section 804 deals with interior trim, whether foam plastic or not.

The old sections 803.1.2.1 was deleted as was the old section 803.8.3 but the information remains, in sections 803.1.1.1 and 803.11, respectively.

In section 804 a general section was included (dealing with the area limitations) and then the same fire safety requirements were kept, with sections 804.1.1 or 804.1.2 relating to trim other than foam plastic and section 804.2 dealing with foam plastic interior trim.

In order to ensure that the proposed reorganization appears in the correct order, I attach a copy of the text as it should read, in its final form.

**Sections 803 and 804 (trim) as final**
803 - INTERIOR WALL AND CEILING FINISH IN EXISTING BUILDINGS

803.1 General. The provisions of this section shall limit the allowable fire performance and smoke development of interior wall and ceiling finishes in existing buildings based on location and occupancy classification. Interior wall and ceiling finishes shall be classified in accordance with Section 803 of the International Building Code. Such materials shall be grouped in accordance with NFPA 286, as indicated in Section 803.1.1, or in accordance with ASTM E84, as indicated in Section 803.1.2. Materials tested in accordance with Section 803.1.1 shall not be required to be tested in accordance with Section 803.1.2.

803.1.1 Interior wall and ceiling finish materials tested in accordance with NFPA 286. Interior wall and ceiling finish materials shall be classified in accordance with NFPA 286 and comply with Section 803.1.1.1. Materials complying with Section 803.1.1.1 shall be considered also to comply with the requirements of a Class A in accordance with Section 803.1.2.

803.1.1.1 Acceptance criteria for NFPA 286. The interior finish shall comply with the following:
1. During the 40 kW exposure, flames shall not spread to the ceiling.
2. The flame shall not spread to the outer extremity of the sample on any wall or ceiling.
3. Flashover, as defined in NFPA 286, shall not occur.
4. The peak heat release rate throughout the test shall not exceed 800 kW.
5. The total smoke released throughout the test shall not exceed 1,000 m².

803.1.2 Interior wall and ceiling finish materials tested in accordance with ASTM E84 or UL 723. Interior wall and ceiling finish materials shall be classified in accordance with ASTM E84 or UL 723. Such interior finish materials shall be grouped in the following classes in accordance with their flame spread and smoke-developed indexes.

Class A: = Flame spread index 0-25; smoke developed index 0-450.
Class B: = Flame spread index 26-75; smoke developed index 0-450.
Class C: = Flame spread index 76-200; smoke developed index 0-450.

Exception: Materials tested in accordance with Section 803.1.1 and as indicated in Section 803.1.3 through 803.15.

803.1.3 Interior wall and ceiling finish materials with different requirements. The materials indicated in Sections 803.4 through 803.15 shall be tested as indicated in the corresponding sections.

803.2 Stability. Interior finish materials regulated by this chapter shall be applied or otherwise fastened in such a manner that such materials will not readily become detached where subjected to room temperatures of 200°F (93°C) for not less than 30 minutes.

803.3 Interior finish requirements based on occupancy. Interior wall and ceiling finish shall have a flame spread index not greater than that specified in Table 803.3 for the group and location designated. Interior wall and ceiling finish materials tested in accordance with NFPA 286 and meeting the acceptance criteria of Section 803.1.1.1, shall be permitted to be used where a Class A classification in accordance with ASTM E 84 or UL 723 is required.

803.4 Fire retardant coatings. The required flame spread or smoke-developed index of surfaces in existing buildings shall be allowed to be achieved by application of approved fire retardant coatings, paints or solutions to surfaces having a flame spread index exceeding that allowed. Such applications shall comply with NFPA 703 and the required fire-retardant properties shall be maintained or renewed in accordance with the manufacturer's instructions.

803.5 Textile wall coverings. Where used as interior wall finish materials, textile wall coverings, including materials having woven or nonwoven, napped, tufted, looped or similar surface and carpet and similar textile materials, shall be tested in the manner intended for use, with the product mounting system, including adhesive, and shall comply with the requirements of one of the following: Section 803.1.1, Section 803.5.1 or Section 803.5.2.

803.5.1 Room corner test for textile wall coverings or expanded vinyl wall coverings. Textile wall coverings or expanded vinyl wall coverings shall meet the criteria of Section 803.5.1.1 when tested in the manner intended for use in accordance with the Method B protocol of NFPA 265 using the product-mounting system, including adhesive.

803.5.1.1 Acceptance criteria for NFPA 265 Method B Test Protocol. The interior finish shall comply with the following:
1. During the 40 kW exposure, flames shall not spread to the ceiling.
2. The flame shall not spread to the outer extremities of the samples on the 8-foot by 12-foot (203 by 305 mm) walls.
3. Flashover, as defined in NFPA 265, shall not occur.
4. For newly introduced wall coverings, the total smoke released throughout the test shall not exceed 1,000 m².

803.5.2 Acceptance criteria for textile or ceiling coverings or expanded vinyl wall or ceiling coverings tested to ASTM E 84 or UL 723. Textile wall or ceiling coverings or expanded vinyl wall or ceiling coverings shall have a Class A flame spread index in accordance with ASTM E 84 or UL 723 and be protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. Test specimen preparation and mounting shall be in accordance with ASTM E 2404.

803.6 Textile ceiling coverings. Where used as interior ceiling finish materials, textile ceiling coverings, including materials having woven or nonwoven, napped, tufted, looped or similar surface and carpet and similar textile materials, shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of one of the following: Section 803.1.1 or of Section 803.5.2.

803.7 Expanded vinyl wall coverings. Where used as interior wall finish materials, expanded vinyl wall coverings shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of one of the following: Section 803.1.1, Section 803.5.1 or Section 803.5.2.
803.8 Expanded vinyl ceiling coverings. Where used as interior ceiling finish materials, expanded vinyl ceiling coverings shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of Section 803.1.1 or of Section 803.5.2.

803.9 High-density polyethylene (HDPE) and polypropylene (PP). Where high-density polyethylene or polypropylene is used as an interior finish it shall comply with Section 803.1.1.

803.10 Site-fabricated stretch systems. Where used as newly installed interior wall or interior ceiling finish materials, site-fabricated stretch systems containing all three components described in the definition in Chapter 2 shall be tested in the manner intended for use, and shall comply with the requirements of Section 803.1.1 or 803.1.2. If the materials are tested in accordance with ASTM E 84 or UL 723, specimen preparation and mounting shall be in accordance with ASTM E 2573.

803.11 Foam Plastic materials. Foam plastic materials shall not be used as interior wall finish or interior ceiling finish unless specifically allowed by Section 803.11.1 or 803.11.2. Foam plastic materials shall not be used as interior trim unless specifically allowed by Section 804.2.

803.11.1. Combustibility Characteristics. Foam plastic materials shall be allowed on the basis of fire tests that substantiate their combustibility characteristics for the use intended under actual fire conditions, as indicated in Section 2603.9 of the International Building Code. This section shall apply both to exposed foam plastics and to foam plastics used in conjunction with a textile or vinyl facing or cover.

803.11.2 Thermal barrier. Foam plastic material shall be allowed if it is separated from the interior of the building by a thermal barrier in accordance with Section 2603.4 of the International Building Code.

803.12 Facings or wood veneers intended to be applied on site over a wood substrate. Facings or veneers intended to be applied on site over a wood substrate shall comply with one of the following:
1. The facing or veneer shall meet the criteria of Section 803.1.1 when tested in accordance with NFPA 286 using the product-mounting system, including adhesive, described in Section 5.8.9 of NFPA 286.
2. The facing or veneer shall have a Class A, B or C flame spread index and smoke-developed index, based on the requirements of Table 803.3, in accordance with ASTM E 84 or UL 723. Test specimen preparation and mounting shall be in accordance with ASTM E 2404.

803.13 Laminated products factory-produced with a wood substrate. Laminated products factory-produced with a wood substrate shall comply with one of the following:
1. The laminated product shall meet the criteria of Section 803.1.1 when tested in accordance with NFPA 286 using the product-mounting system (including adhesive) of actual use.
2. The laminated product shall have a Class A, B, or C flame spread index and smoke-developed index, based on the requirements of Table 803.3, in accordance with ASTM E84 or UL 723. Test specimen preparation and mounting shall be in accordance with ASTM E 2579.

803.14 Thickness exemption. Materials having a thickness less than 0.036 inch (0.9 mm) applied directly to the surface of walls or ceilings shall not be required to be tested.

803.15 Heavy timber exemption. Exposed portions of building elements complying with the requirements of buildings of Type IV construction in accordance with the International Building Code shall not be subject to interior finish requirements, except in interior exit stairways, interior exit ramps, and exit passageways.

804 - Interior Wall and Ceiling Trim and Interior Floor Finish in New and Existing Buildings

804.1 Interior trim. Combustible trim in new and existing buildings, excluding handrails and guardrails, shall not exceed 10 percent of the specific wall or ceiling areas to which it is attached. Material, other than foam plastic, used as interior trim shall comply with Section 804.1.1 or with Section 804.1.2. Foam plastic used as interior trim shall comply with Section 804.2.

804.1.1 Testing in accordance with NFPA 286. Interior trim material shall be tested in accordance with NFPA 286 and comply with the acceptance criteria in Section 803.1.1.1. When the interior trim material has been tested as an interior finish in accordance with NFPA 286 and complies with the acceptance criteria in Section 803.1.1.1, it shall not be required to be tested for flame spread index and smoke-developed index in accordance with ASTM E 84 or UL 723.

804.1.2 Testing in accordance with ASTM E84 or UL 723. Material, other than foam plastic, used as interior trim shall have minimum Class C flame spread and smoke-developed indices, when tested in accordance with ASTM E 84 or UL 723, as described in Section 803.1.2.

804.2 Foam plastic interior trim. Foam plastic used as interior trim shall comply with Sections 804.2.1 through 804.2.4.

804.2.1 Density. The minimum density of the interior trim shall be 20 pounds per cubic foot (320 kg/m³).

804.2.2 Thickness. The maximum thickness of the interior trim shall be 1/2 inch (12.7 mm) and the maximum width shall be 8 inches (203 mm).

804.2.3 Area limitation. The interior trim shall not constitute more than 10 percent of the specific wall or ceiling area to which it is attached.

804.2.4 Flame spread. The flame spread index shall not exceed 75 where tested in accordance with ASTM E 84 or UL 723. The smoke-developed index shall not be limited.
Exception: When the interior trim material has been tested as an interior finish in accordance with NFPA 286 and complies with the acceptance criteria in Section 803.1.1.1, it shall not be required to be tested for flame spread index in accordance with ASTM E 84 or UL 723.

Cost Impact: Will not increase the cost of construction
This is simply a reorganization for logical use and consistency with IBC.

Public Hearing Results
Committee Action: Disapproved
Committee Reason: The committee had concerns regarding the application to existing buildings. Specifically that many buildings including those of Heavy Timber Type IV construction would not be in compliance. It was also noted that the proposal contains conflicts in the requirements of the referenced standards.

Online Vote Results: As Modified
Support: 17.43% (61) Oppose: 82.57% (289)
Assembly Action: None

Online Floor Modification:
803.1 General. The provisions of this section shall limit the allowable fire performance and smoke development of interior wall and ceiling finishes in existing buildings based on location and occupancy classification. Interior wall and ceiling finishes shall be classified in accordance with Section 803 of the International Building Code. Such materials shall be grouped in accordance with NFPA 286, as indicated in Section 803.1.1, or in accordance with ASTM E84 or UL 723, as indicated in Section 803.1.2. Materials tested in accordance with Section 803.1.1 shall not be required to be tested in accordance with Section 803.1.2.

803.15 Heavy timber exemption Exposed portions of building elements complying with the requirements of Type IV construction in accordance with the International Building Code shall not be subject to interior finish requirements, except in interior exit stairways, interior exit ramps, and exit passageways.

Commenter's Reason: This change is necessary to line up the IFC with the IBC (where the same change) has already been made. Other codes (NFPA 101 and NFPA 5000) have also adopted this change which does not change requirements but simply puts them in a logical order.

The committee noted an error in section 803.15 where the text proposed included the same requirements as in the IBC, which deals (of course) with new construction, while the IFC deals also with existing construction. The requirement that heavy timber should have to meet fire safety requirements in the IFC has now been eliminated.

The change proposed in 803.1 is simply for consistency with all other sections of the code, including everywhere in chapter 8:
whenever ASTM E84 is mentioned UL 723 is also included as an alternate option because they are equivalent tests.
Proposed Change as Submitted

Proponent: Marcelo Hirschler, representing GBH International (gbhint@aol.com)

2015 International Fire Code

Revise as follows:

803.1 General. The provisions of this section shall limit the allowable fire performance and smoke development of interior wall and ceiling finishes and interior wall and ceiling trim in existing buildings based on location and occupancy classification. Interior wall and ceiling finishes shall be classified in accordance with Section 803 of the International Building Code. Such materials shall be grouped in accordance with ASTM E 84, as indicated in Section 803.1.1, or in accordance with NFPA 286, as indicated in Section 803.1.2.

Exceptions:
1. Materials having a thickness less than 0.036 inch (0.9 mm) applied directly to the surface of walls and ceilings.
2. Exposed portions of structural members complying with the requirements of buildings of Type IV construction in accordance with the International Building Code shall not be subject to interior finish requirements, except in interior exit stairways, interior exit ramps and exit passageways.

Reason: This provides consistency with the change incorporated into the IBC as a result of accepted proposal FS132-15, from David Tyree. The rationale for the proposal was as follows:
"Cross laminated timber may be used to form the entire interior surfaces of egress elements and should be regulated in those circumstances.
The requirement is the same for any other material used in those circumstances. For a complete list of AWC code change proposals and additional information please go to http://www.awc.org/Code-Officials/2015-IBC-Code-Changes."
This change is also being incorporated as part of the overall proposed change for section 803 in a different proposal.

Cost Impact: Will increase the cost of construction
There will be a need for fire testing of some heavy timber materials.

Committee Action: Disapproved
Committee Reason: The committee stated that the proposed text should not apply to existing buildings and contains bad code language in the form of an exception within an exception.

Assembly Action: None

Individual Consideration Agenda

Proponent: William Hall, representing Portland Cement Association (jhall@cement.org) requests Approve as Submitted.

Commenter's Reason: Without this amendment to the exception, all surfaces of heavy timber construction can be unprotected by a layer(s) of gypsum. Heavy timber allows construction permits over 4 stories and thereby requires 2 hour ratings for stair shafts. There are currently no testing reports that substantiate un-protected heavy timber can perform structurally for 2 hours. This amendment is needed to protect heavy timber when higher ratings are required.
F128-16
IFC: 202 (New), 805.3.2.2.1.

Proposed Change as Submitted

Proponent: Marcelo Hirschler, representing GBH International (gbhint@aol.com)

2015 International Fire Code
Revise as follows:

805.3.2.2.1 Heat release rate. Newly introduced mattresses shall have limited rates of heat release when tested in accordance with ASTM E 1590 or California Technical Bulletin 129, as follows and shall comply with the following:

1. The peak rate of heat release for the single mattress shall not exceed 100 kW.
2. The total energy released by the single mattress during the first 10 minutes of the test shall not exceed 25 MJ.
3. Flaming droplets shall not be formed during the test.

Add new definition as follows:

SECTION 202 DEFINITIONS

FLAMING DROPLETS. Flaming liquefied or viscous material that separates and drips from the test specimen during the fire test and continues to burn with flame on the surface upon which it lands.

Reason: It has been shown that some mattresses intended for detention occupancies (I-3) pass the ASTM E1590 test by virtue of melting and generating flaming droplets, which can then ignite material on the floor (possessions of the inmate) and spread the fire. The flaming of liquefied material can also contribute to additional ignition of the original item(s). The proposed change introduces a requirement that mattresses should not generate flaming droplets when they burn. Mattress fire test criteria to eliminate flaming droplets is already a requirement by the US Navy. Approval of the code change would mean that such mattresses would not be permitted in detention facilities. This will not eliminate the majority of the mattresses in actual use. A definition is proposed for flaming droplets to clarify what is meant.

Cost Impact: Will increase the cost of construction
This change may increase increase the cost of construction for some mattresses made of synthetic materials with a tendency to melt or drip, with flaming droplets. Thus, it is possible that the added requirement may mean that some materials will be unable to meet all the provisions. However many of the mattresses used in this application already meet this requirement so there will not necessarily be an increase in cost of construction.

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The committee stated that the new proposed requirement and definition did not belong in a section with the existing title of "Heat release rate" and that the definition of "Flaming droplets" should be listed in the new requirement within 805.3.2.2.1 and not as a new definition.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Marcelo Hirschler, representing GBH International (gbhint@aol.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

805.3.2.2 Fire performance tests. Newly introduced mattresses shall be tested in accordance with Section 805.3.2.2.1 or 805.3.2.2.2 and shall also meet the requirements in 805.3.2.2.3.

805.3.2.2.1 Heat release rate. Newly introduced mattresses shall have limited rates of heat release when tested in
accordance with ASTM E 1590 or California Technical Bulletin 129, and shall comply with the following as follows:

1. The peak rate of heat release for the single mattress shall not exceed 100 kW.
2. The total energy heat released by the single mattress during the first 10 minutes of the test shall not exceed 25 MJ.
3. Flaming droplets shall not be formed during the test.

805.3.2.2 Mass loss test. Newly introduced mattresses shall have a mass loss not exceeding 15 percent of the initial mass of the mattress where tested in accordance with the test in Annex A3 of ASTM F 1085.

805.3.2.2.3 Flaming droplets Flaming droplets shall not be formed during the test.

SECTION 202 - FLAMING DROPLETS

Flaming liquefied or viscous material that separates and drips from the test specimen during the fire test and continues to burn with flame on the surface upon which it lands.

Commenter’s Reason: The committee stated that the definition was unnecessary (because the term is not used elsewhere in the code) and that the requirements for no flaming droplets should be moved away from the section on heat release rate. Both changes have been made and the remaining language has been returned to existing code language. The ASTM standards do not have acceptance criteria but the formation of flaming droplets must be reported and criteria for flaming droplets in these standards are used, for example by the US Navy and by some detention authorities. The proposed change from “energy” to “heat” is simply intended to accept the approved change from proposal F126.
Committee Action: Disapproved

Assembly Action: None

F131-16: 806.1.4 (New).

Proponent: Marcelo Hirschler, representing GBH International (gbhint@aol.com)

2015 International Fire Code

Add new text as follows:

806.1.4 Fire retardant treatments for natural cut trees, if a fire retardant treatment is used to improve the fire performance of a natural cut tree the treatment shall have been approved for the application.

Reason: It has been shown that multiple treatments exist that claim to be appropriate for improving the fire performance of natural cut trees (typically Christmas trees) but not all of them are equally suitable for the application. If a treatment is used it must have been approved. In the state of California such an approval procedure exists and in ASTM a committee has developed a test method for conducting such approvals. The present proposal does not endorse any specific method because that is up to the ahj, but it is important that someone approves the use of any treatment being proposed for use. When a natural tree burns it can generate very high rates of heat release.

Cost Impact: Will increase the cost of construction
This will require treatments to show that they are effective before being allowed for regulated use.

Public Hearing Results

Committee Action: Disapproved
Committee Reason: The committee stated that the new proposed requirement would be difficult to enforce and that the fire retardant method requirements are uncertain.

Assembly Action: None

Public Comment 1:

Proponent: Marcelo Hirschler, representing GBH International (gbhint@aol.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

806.1.4 Fire Flame retardant treatments for natural cut trees. If a fire retardant treatment is used to improve the fire performance of fresh green branches of Douglas fir. The treated branches shall comply with the fire propagation performance criteria of a natural cut tree the treatment shall have been approved for the application Test Method 1 of NFPA 701.

Commenter’s Reason: The state of California (for example) has found that products are being sold with the intent of being used as flame retardant treatments for natural Christmas trees but that they do not always work as expected. For that reason they have implemented a system (in the Code of Regulations) whereby flame retardant treatments must be approved by the authority having jurisdiction after having been tested for efficacy. The test to be used is in section 1237.1 of the code (see attached) and the requirements applicable to Christmas trees are in section 1264.3 (also attached). This public comment does not require the use of the California test but would require that the products be tested with a known fire test when applied to tree branches (using the same method of application to branches as California). Since the actual California test is not used in the IFC, this comment requires compliance with a similar test (Test 1 of NFPA 701), used for decorations throughout the IFC.
California Code of Regulations, Title 19, Chapters 2, 7 and 8

Flame Retardant Regulations
TEST REQUIREMENTS FOR
INTERIOR FLAME-RETARDANT CHEMICALS
(When Applied to Materials other than Fabrics)

1264. General Requirements.

(a) Tests shall be performed by an approved laboratory, or by the laboratory of the State Fire Marshal.

(b) Sufficient quantities of the chemical and the material for the treatment of which approval is desired shall be submitted to the laboratory, where the chemical shall be applied in accordance with the manufacturer’s directions.

(c) The laboratory shall test the treated specimens in accordance with the requirements of the applicable subsection(s) below.

(d) The laboratory shall allow treated and untreated specimens to age at normal room conditions for 30 days, during and after which period the specimens shall be examined and the condition and appearance of the chemical or coating shall dry to the touch within 4 hours and dry completely within 24 hours. During and after the aging period, there shall be no appreciable change in color or appearance, and no evidence of poor adhesive qualities (such as would be indicated by any tendency toward flaking or powdering off.)

(e) A copy of the laboratory report shall be submitted to the State Fire Marshal, covering in detail the method of application or treatment (number of coats, coverage in square feet per gallon, dilution if any, etc.), the results of tests, and the description of the condition or appearance of the treated specimens after aging (including change of color, dryness, brittleness, and any other pertinent qualities). The laboratory or manufacturer shall also submit to the State Fire Marshal at least 1 quart of the chemical, together with specimens of the material for the treatment of which approval is desired.

(f) The State Fire Marshal may perform such additional tests as he deems advisable or necessary, and his decision insofar as approval and listing of the chemical are concerned shall be final.

Authority: Health and Safety Code Sections 13120, 13121
Reference: Health and Safety Code Sections 13100 through 13132
1264.1. Wooden and Compressed Cellulose Fiber Decorative Material. Chemicals of the surface treatment type which are intended for the flame-retardant treatment of wooden and compressed cellulose fiber decorative materials shall be capable of being readily applied by brush or spray to achieve the required coverage.

Approval of chemicals for the flame-retardant treatment of compressed cellulose fiber and wooden decorative materials shall be based upon tunnel test results when performed by a laboratory properly equipped and staffed to make the test.

Chemicals which achieve a maximum fire hazard of 70 for flame spread will be acceptable, where treated oak is rated at 100 and incombustible asbestos-cement board is rated at 0.

Chemicals intended for flameproofing nonsolid wooden decorative materials, such as sawdust, shavings and excelsior shall be approved if they are capable of satisfactorily treating cotton. (See Section 1216(b)).

Authority: Health and Safety Code Sections 13120, 13121
Reference: Health and Safety Code Sections 13100 through 13132

1264.2. Bast and Leaf Fibrous Decorative Materials. The fire-resistance test shall be performed at the completion of the 30-day aging period, and shall be conducted as nearly as practical as described in Section 1237.1. Tests shall be made on several different areas of the treated materials. There shall be no spread of flame from the area in contact with the test flame, and any afterflaming shall not exceed 10 seconds.

Authority: Health and Safety Code Sections 13120, 13121
Reference: Health and Safety Code Sections 13100 through 13132

1264.3. Christmas Trees. The chemical shall be applied to fresh green branches of Douglas fir, approximately 3 feet long. The fire-resistance test shall be performed at the completion of the 30-day aging period, and shall be conducted as nearly as practical as described in Section 1237.1. Tests shall be made on several different areas of the treated branch.

There shall be no spread of flame from the area in contact with the test flame, and any afterflaming shall not exceed 10 seconds. At the completion of the 30-day aging period, the treated branch shall not lose its needles more readily nor shall they have turned brown to a greater extent than those of the untreated branch similarly aged.
1236. Water Extraction. The treated fabric, after water extraction, shall meet the requirements for fire resistance outlined in Sections 1237 and 1237.2.

Authority: Health and Safety Code Sections 13120, 13121
Reference: Health and Safety Code Sections 13100 through 13132

1237. Fire Resistance. (Small Scale Test) The treated fabric, in its original state, after accelerated weathering, and after water extraction, shall be tested in accordance with the method outlined in Section 1237.1 below, and shall not continue to flame for more than 2 seconds after the burner is removed. The average length of char (for the standard test fabric) shall not exceed 3½-inches. The maximum for any fabric shall not exceed 6 inches.

Authority: Health and Safety Code Sections 13120, 13121
Reference: Health and Safety Code Sections 13100 through 13132

1237.1. Test Method. (Small Scale Test) The specimens shall be conditioned by suspending them in an oven having mechanical air circulation, at temperatures of 140°F to 145°F for not less than 1 hour nor more than 1½ hours. Materials which distort or melt at the above oven exposure shall be conditioned at 60°F to 80°F and 25% to 50% relative humidity for not less than 24 hours.

Six specimens, each not less than 2½ inches by 12½ inches, shall be subjected to the fire resistance test. One half of each set of specimens shall be cut with the long dimension in the direction of the warp, and the other half with the long dimension in the direction of the fill.

The specimens shall be suspended vertically in a rack which covers the upper ½ inch of the length and holds the sides firmly to prevent curling, leaving a strip 2 inches by 12 inches exposed. To protect the specimens from drafts, the apparatus shall be enclosed in a sheet metal shield 12 inches wide by 12 inches deep by 30 inches high, open at the top and provided with a vertical openable glass front. Sufficient room shall be left at the bottom of the front to allow manipulation of the gas burner used in igniting the specimens.

The specimens shall be suspended with the lower end ¾ inch above the top of a 3/8 inch ID Bunsen or Tirril gas burner, with the air supply completely shut off, and adjusted to give a luminous flame 1½ inch long. The flame shall be applied vertically at the center of the width of the lower end of the specimens for 12 seconds, then withdrawn, and the duration of flaming in the specimens after withdrawal of the burner noted. After complete extinction of all flame and glow in the specimen, the length of char shall be measured as specified in Federal

Authority: Health and Safety Code Sections 13120, 13121
Reference: Health and Safety Code Sections 13100 through 13132

1237.2. Fire Resistance. (Large Scale) The treated fabric, both before and after water extraction, shall be tested in accordance with the method outlined in Section 1237.3 below, and shall not continue to flame for more than 2 seconds after the burner is removed. The vertical spread of flame and afterglow (smoldering combustion), as indicated by the length of char above the tip of the test flame, shall not exceed 10 inches.

Authority: Health and Safety Code Sections 13120, 13121
Reference: Health and Safety Code Sections 13100 through 13132

1237.3. Test Method. (Large Scale Test) The specimens shall be conditioned by suspending them in an oven having mechanical air circulation, at temperatures of 140°F to 145°F for not less than 1 hour nor more than 1 ½ hour. Materials which distort or melt at the above oven exposures shall be conditioned at 60°F to 80°F and 25% to 50% relative humidity for not less than 24 hours.

The apparatus for conducting the flame test shall consist of a sheet steel stack 12 inches square transversely, 7 feet high and supported 1 foot above the floor on legs. The stack shall be open at the top and bottom and shall be provided with a door having an observation window of wired glass extending the full length.

Six specimens, each not less than 5 inches by 7 feet shall be subjected to the fire resistance test. One-half of each set of specimens shall be cut with the long dimension in the direction of the warp, and the other half with the long dimension in the direction of the fill. Two or more pieces may be sewn together to provide the necessary length.

The specimen shall be suspended vertically in the stack with its full width facing the observer so that the bottom of the specimen is 4 inches above the top of a Bunsen burner having a 3/8-inch diameter tube and placed on the floor below the stack. The gas supply to the burner shall be natural gas or a mixture of natural and manufactured gases having a heat value of approximately 800-1000 BTU per cubic foot. With a gas pressure of 4½-inches (108 mm) of water, the burner shall be adjusted to produce an 11 inch oxidizing flame having a indistinct inner cone. The specimen shall be lightly restrained laterally with clamps and guide wires attached to its outer edges.
Committee Action: Disapproved

Assembly Action: None

F134-16 : 807.1-

O'BRIAN11009

Proposed Change as Submitted

Proponent: Michael O'Brian representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code

Revise as follows:

807.1 General. Combustible

In Groups A, E, I and R-1, and dormitories in Group R-2, combustible decorative materials, other than decorative vegetation, shall comply with Sections 807.2 through 807.5.6.

Reason: When F109-13 was submitted, the reason stated that it was only a clarification. But in fact, the requirements for combustible decorative materials which previously had only applied to A, E, I, R-1 and dormitories in R-2 suddenly applied to all occupancies. It appears that change was done unintentionally, so this proposal intends to correct that situation. There is no significant reason to begin regulating drapes and curtains in Group F, S or U occupancies. Additionally, there are no specific occupancy limitations noted in Sections 807 and 808 for Groups F, S and U. So this proposal is consistent with the remainder of the provisions.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Cost Impact: Will not increase the cost of construction

This proposal will not increase the cost of construction. In fact, it will reduce the cost of construction in those occupancies which do not need to comply.

Individual Consideration Agenda

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The committee stated that the description of the occupancies and the criteria for their inclusion needed improvement.

Assembly Action: None

Public Comment 1:

Proponent: Jeffrey Shapiro, International Code Consultants, representing Self (jeff.shapiro@intlcodeconsultants.com) requests Approve as Modified by this Public Comment.

Replace Proposal as Follows:

2015 International Fire Code

807.1 General. Combustible decorative materials, other than decorative vegetation, shall comply with Sections 807.2 through 807.5.6.

807.1 General. Combustible decorative materials, other than decorative vegetation, shall comply with Sections 807.2 through 807.5.6. apply to all occupancies:

1. Furnishings or decorative materials of an explosive or highly flammable character shall not be used.
2. Fire-retardant coatings in existing buildings shall be maintained so as to retain the effectiveness of the treatment under service conditions encountered in actual use.
3. Furnishings or other objects shall not be placed to obstruct exits, access thereto, egress therefrom or visibility thereof.
The permissible amount of decorative vegetation and noncombustible decorative materials shall not be limited.

807.3 Combustible decorative materials. In other than Group A, B, E, I, M and R-1 and in dormitories in Group I-3 R-2, curtains, draperies, fabric hangings and other similar combustible decorative materials suspended from walls or ceilings shall comply with Section 807.4 and shall not exceed 10 percent of the specific wall or ceiling area to which they are attached.

Fixed or movable walls and partitions, paneling, wall pads and crash pads applied structurally or for decoration, acoustical correction, surface insulation or other purposes shall be considered interior finish, shall comply with Section 803 and shall not be considered decorative materials or furnishings.

Exceptions:

1. In auditoriums in Group A, the permissible amount of curtains, draperies, fabric hangings and other similar combustible decorative material suspended from walls or ceilings shall not exceed 75 percent of the aggregate wall area where the building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, and where the material is installed in accordance with Section 803.13 of the International Building Code.

2. In Group R-2 dormitories, within sleeping units and dwelling units, the permissible amount of curtains, draperies, fabric hangings and other similar decorative materials suspended from walls or ceilings shall not exceed 50 percent of the aggregate wall areas where the building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.

3. In Group B and M occupancies, the amount of combustible fabric partitions suspended from the ceiling and not supported by the floor shall comply with Section 807.4 and shall not be limited.

807.5 Occupancy-based requirements. In occupancies specified, combustible decorative materials not complying with Section 807.3 Occupancies shall comply with Sections 807.5.1 through 807.5.6.

Commenter’s Reason: 1. Section 807.1 is unneeded. All of the subsections of Section 807 are self-contained, and in addition, the text is incorrect in stating that combustible decorative materials are required to comply with the following provisions. It is actually the occupancies containing the materials that are regulated with respect to the decorative materials that are or aren’t permitted. It appears that the proponents of this text, added to the 2015 edition by Code Change F109-13, were trying to use this section to exempt decorative vegetation. That being the case, this allowance has been moved to the new Section 807.1, previously 807.2, in Item 4.

2. The revision to Section 807.3 reinstates a list of occupancy classifications that previously applied in the 2012 code and were deleted from the text in 2015 by Code Change F109-13 without reason or justification. As modified by this comment, the provisions get much closer to what was required by the 2012 code, as they should be. There is simply no justification for these requirements to apply to factories, storage occupancies and other uses that the requirements didn’t apply to before the 2015 edition.

3. Section 807.5 has been revised because the allowance to exempt occupancies listed in this section from their applicable special regulations based on complying with Section 807.3 (general decorative material restrictions) is potentially dangerous. For example, restrictions on the use of foam plastics in Group A are currently waived if you comply with Section 807.3. How this was overlooked in the rewrite of this section is amazing, but it needs to be fixed to close a huge hole in the code.
F139-16

Proposed Change as Submitted

Proponent: Marcelo Hirschler, representing GBH International (gbhint@aol.com)

2015 International Fire Code

Add new text as follows:

**SECTION 809 CHILDREN'S PLAY STRUCTURES**

**809.1 General.** Children's play structures installed inside all occupancies covered by this code that exceed 10 feet (3048 mm) in height or 150 square feet (14 m²) in area shall comply with Section 424 of the *International Building Code*.

**Reason:** This is simply a pointer from the IFC to the IBC for children's play structures incorporated into existing occupancies. The fire testing that led to its inclusion into the IBC showed that these children's playground structures or play structures can release very large amounts of heat when they burn and need to be regulated.

**Cost Impact:** Will increase the cost of construction

If children's play structures are included as part of new construction, the IBC already applies but if they are built later they would need to be covered by this code.

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Public Hearing Results

Committee Action: Disapproved

Committee Reason: The committee stated that the proposed new section is not within the scope of the IFC and should be in the IBC.

Assembly Action: None

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Individual Consideration Agenda

Public Comment 1:

Proponent: Marcelo Hirschler, representing GBH International (gbhint@aol.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

**809.1 General.** Where children's play structures installed inside all occupancies covered by this code that exceed 10 feet (3048 mm) in height or 150 square feet (14 m²) in area and are installed indoors in existing structures they shall comply with Section 424 of the *International Building Code*.

Commenter's Reason: The IBC deals with play structures at the time of construction but play structures are often added into malls or restaurants after the fact and this proposal simply sends a pointer. Moreover as play structures age they are often removed and replaced and the IBC would normally not apply.
Committee Action: Disapproved

Assembly Action: None

F147-16 : 901.7-

**Proposed Change as Submitted**

**Proponent:** William Hall, Portland Cement Association (jhall@cement.org)

**2015 International Fire Code**

**Revise as follows:**

901.7 Systems out of service. Where a required fire protection system is out of service, all occupants, the fire department and the fire code official shall be notified immediately and, where required by the fire code official, the building shall be either evacuated or an approved fire watch shall be provided for all occupants left unprotected by the shutdown until the fire protection system has been returned to service.

During any time period that the automatic fire suppression system is out of service for a period of over 4 hours, a placard viewable from the exterior shall be placed on all exterior doors serving as exit discharge.

1. The placards shall be placed such that it is centered in the width of the door and the center of the placard be not less than 4 feet (1219 mm) and no more than 6 feet (1,829 mm) above the threshold.
2. The placards shall be 8 inches high by 16 inches long (203 mm by 406 mm) in size with a white background, black letters and a black border.
3. Placards shall state:
   3.1 Line 1: "FIRE SPRINKLERS"
   3.2 Line 2: "in this building are"
   3.3 Line 3: "OUT OF SERVICE"

Where utilized, fire watches shall be provided with not less than one approved means for notification of the fire department and their only duty shall be to perform constant patrols of the protected premises and keep watch for fires.

**Reason:** We have discovered what we feel is an oversight in the fire code. As the codes are developed to be a vital component to life safety, information shared to the occupants of the building, when it affects them should be equally vital. When the fire suppression system which was designed and installed to protect the occupants within a structure is not working or out of service, it would make sense that those same occupants or visitors should be aware that the system is out of service. This proposal would require that occupants currently in the building be notified immediately and placards be placed at the doors to alert others, if over 4 hours, until the situation is resolved and the fire sprinkler system is operational. When sprinkler system become out of service, rarely are buildings evacuated or proper fire watches established. After large storms or disasters, water supply or electrical service may not be available for days or even weeks. Emergency maintenance issues arise where parts or fire pump may not available for a period of time. Frozen and busted pipes are additional common reasons for fire systems being out of service. It would seem incumbent on the fire code to notify occupants when their safety net is not up. A text message or email would be sufficient to meet the intent of the new language.

**Cost Impact:** Will not increase the cost of construction
This proposal will not increase the cost of construction other than printing costs for re-usable signs.

F147-16 : 901.7-
HALL12212

**Public Hearing Results**

**Committee Action:** Disapproved

**Committee Reason:** The committee stated that the proposed time that the system is out of service in order to require the placard was not substantiated and that existing safeguards in the impairment section are sufficient.

**Assembly Action:** None

**Individual Consideration Agenda**

**Public Comment 1:**

**Proponent:** William Hall, representing Portland Cement Association (jhall@cement.org) requests Approve as Modified by this Public Comment.

**Modify as Follows:**

2015 International Fire Code
901.7 Systems out of service. Where in Occupancy Groups B, I and R where a required fire protection sprinkler system is out of service, all occupants, the fire department and the fire code official shall be notified immediately and, where required by the fire code official, the building shall be either evacuated or an approved fire watch shall be provided for all occupants left unprotected by the shutdown until the fire protection system has been returned to service.

During any time period that the automatic fire suppression system is out of service for a period of over 48 hours, a placard sign viewable from the exterior shall be placed on all exterior doors the door serving as exit discharge the main entrance.

1. The placards shall be placed such that it is centered in the width of the door and the center of the placard be not less than 4 feet (1219 mm) and no more than 6 feet (1,829 mm) above the threshold.
2. The placards shall be 8 inches high by 16 inches long (203 mm by 406 mm) in size with a white background, black letters and a black border.
1. The sign shall be a minimum of 12 inches high by 8 inches wide (203 mm by 406 mm) in size with a white background. Letters shall be a minimum of 2 inches tall.
2. Placards shall state:
   2.1.Line 1: "FIRE SPRINKLERS"
   2.2.Line 2: "in this building are"
   2.3.Line 3: "OUT OF SERVICE."

Where utilized, fire watches shall be provided with not less than one approved means for notification of the fire department and their only duty shall be to perform constant patrols of the protected premises and keep watch for fires.

Commenter's Reason: Based on the committee and opponents statements, the proposals has been modified to only include B, I and R occupancies. Only main doors need to be provided with placard
Proposed Change as Submitted

Proponent: Bob Morgan, PE, representing Fort Worth Fire Department

2015 International Fire Code

901.8.2 Removal of existing occupant-use hose lines. The fire code official is authorized to permit the removal of existing occupant-use hose lines where all of the following conditions exist:

1. Installation is not required by this code or the International Building Code.
2. The hose line would not be utilized by trained personnel or the fire department.
3. The remaining outlets are compatible with local fire department fittings.

Reason: If the existing hose lines will not be utilized by the occupants or the fire department, then what exactly is the point of having them? We regularly field this request to remove occupant-use hose lines, and if the occupants are not trained in their use, and the fire department will not utilize them, then they serve no purpose, other than to possibly serve as an attractive nuisance, maintenance expense, and to slow down the fire department attempting to connect their own hose to the hose valve outlet. This change would simply give the fire code official the authority to allow removal of these hose lines. It would not require anyone to do so.

Cost Impact: Will not increase the cost of construction
This change would expand the ability to allow removal of occupant-use hose lines, and therefore, save the significant costs of testing and maintaining these hose lines.

Public Hearing Results

Committee Action: Approved as Submitted
Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: None

Individual Consideration Agenda

Proponent: Daniel E Nichols, Roosevelt Fire District, representing Self requests Disapprove.

Commenter's Reason: This proposal could add confusion for new buildings. For those occupancies that are required to have Class II or III standpipe systems when constructed, this language would require hoses for the issuance of the Certificate of Occupancy and then immediately allow for their removal. The action on F185 by the committee has permitted the removal of occupant hose system requirements in unsprinklered Group B and E buildings, creating a basis that occupant hose and sprinklered buildings have little comparison in fire protection. A public comment has been submitted for F185 to align the goals of this proposal but to place it to avoid the conflict for new buildings.
Committee Action: Disapproved

Committee Reason: The committee stated that the proposal is unnecessary and that it is not within the intent for the existing section as written. In addition, it is a huge cost to building owners and is an overreach to a Group B occupancy classification.

Assembly Action: None

Individual Consideration Agenda

Proponent: John Williams, CBO, representing Adhoc Healthcare Committee (AHC@iccsafe.org) requests Approve as Submitted.
**Commenter's Reason:** The IFC development committee stated that this is a huge cost to building owners and is an overreach to a Group B occupancy classification. The current requirements is to sprinkler at the level of the ambulatory care facility and floors below. The only addition cost is to also ask for any basements (that are not a parking garage) to also be sprinklered. If you have no basement levels, then there is no additional costs. Where there are care recipients not capable of self preservation, the extra time afforded by a sprinkler system is required to allow for medical staff to back out of procedures or to assist patients to evacuate. If a Group B building does not have a sprinkler system, they can choose not to rent to ambulatory care facilities rather than to add sprinklers.
Committee Action: Disapproved

Assembly Action: None

F157-16 : 903.2.3- DIGIOVANN12518

2015 International Fire Code

Revise as follows:

903.2.3 Group E. An automatic sprinkler system shall be provided for Group E occupancies as follows:
1. Throughout all Group E fire areas greater than 12,000 square feet (1115 m²) in area.
2. Throughout every portion of educational buildings below the lowest level of exit discharge serving that portion of the building.
   - Exception: An automatic sprinkler system is not required in any area below the lowest level of exit discharge serving that area where every classroom throughout the building has not fewer than one exterior exit door at ground level.
3. The fire area has an occupant load of 50 or more.
4. The fire area is located on a floor other than a level of exit discharge serving such occupancies.

Exception: An automatic sprinkler system is not required in any area below the lowest level of exit discharge serving that area where every classroom throughout the building has not fewer than one exterior exit door at ground level.

Reason: Currently the Fire Code does not contain a fire sprinkler trigger in Group E occupancies based on occupant load. The occupant load derived from current code can be up to 600 persons, using the occupant load factor of 20 and the square footage trigger of 12,000 sf. This occupant load far exceeds the occupant load triggers provided for Group A occupancies. However, children are less capable of self-preservation than adults, yet the code provides more protection to adults than to children. There is also a discrepancy in construction type, where the allowable areas for educational facilities often exceeds the allowable areas for assembly occupancies. When looking at IBC Table 503, excluding outdoor group A-5 occupancies, the allowable area for each type of construction is greater for group E occupancies than for any of Groups A-1, A-2, A-3, and A-4. Essentially, children are located in less fire-resistive buildings and with less fire sprinkler protection.

To further complicate the issue, due to recent events in society, more and more schools are developing protect-in-place strategies to ensure safety for children. It is reasonable to expect a higher level of protection for occupancies where egress may be slowed.

This proposal seeks to add a fire sprinkler trigger of 50 person occupant load for educational buildings. The 50 person trigger has been used in Clark County for 20 years. The proposal desires to expand this code requirement to the base IFC.

Cost Impact: Will increase the cost of construction
Will require a fire sprinkler system installation in many education buildings that are currently not required by the IFC to have fire sprinkler protection

Public Hearing Results

Committee Reason: The committee stated that with a proposed occupancy limit of 50, the proposal is too restrictive and that portable buildings would be problematic. In addition it was stated that Group E occupancy buildings have fire drills and Group A Occupancy buildings do not.

Assembly Action: None

Public Comment 1:

Proponent: Stephen DiGiovanni, representing Southern Nevada Chapter of ICC (sdigiovanni@clarkcountynv.gov); Nick Moriarty, representing Southern Nevada - ICC (nick.moriarty@jbace.com) requests Approve as Modified by this Public Comment.
Modify as Follows:

2015 International Fire Code

903.2.3 Group E. An automatic sprinkler system shall be provided for Group E occupancies as follows:

1. Throughout all Group E fire areas greater than 12,000 square feet (1115 m²) in area.
2. The fire area has an occupant load of 60, 300 or more.
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.

Exception: An automatic sprinkler system is not required in any area below the lowest level of exit discharge serving that area where every classroom throughout the building has not fewer than one exterior exit door at ground level.

Commenter's Reason: The IFC Committee and assembly raised several objections to the proposal, including: (a) the proposed threshold is way too low; (b) no technical justification was provided to support the proposal (i.e., no demonstration of need, loss data, etc.); (c) schools respond to fire alarms and have orderly evacuations, so the comparison of Group E to Group A is not valid; and (d) the proposal is too punitive for portable classroom buildings (e.g., double-wide trailers). During the testimony on F157-16, the committee stated that they felt that the proposed trigger of 50 occupants was too low, there was little justification to the reasoning of the trigger, and specifically there was no loss history associated with school fires. The proposal has been modified to address two of the committee's concerns, one being that the occupant load was too low and the question as to why the threshold for fire area was still listed as 12,000 square feet. Utilizing an occupant load factor 20 square feet/person, the area of 6,000 square feet and occupant load of 300 now correlate.

The 300 threshold is also used as a trigger for sprinklers in Group A-1, A-3 and A-4 occupancies. This is a common threshold used throughout the code, including the examples noted above, plus for manual fire alarm systems in Group A per IFC 907.2.1, assembly main exit provisions per IFC Section 1028.2, horizontal building separation allowances in IBC Section 510.2, Class C interior finishes in non-sprinklered Group A-1 or A-2 rooms or enclosed spaces per IBC Table 803.9 footnote e, door locks and latches in Group A per IBC Section 1008.1.9.3.

One of the other reasons for disapproval that was brought up during testimony was that schools typically have fire drills and therefore the occupants are familiar with how to evacuate during an event. This is true, however many schools serve multiple purposes, including parent/teacher conference night, open houses for prospective parents and students who may have never been to the school, political elections and adult education classes during the evening. If these uses are to be allowed, then the actual use of the school would be more of a Group A, not Group E, since the population is predominantly adults in the after-hours situations.

Sprinklers are widely recognized as the single most effective method for fighting the spread of fires in the early stages, before they can cause severe injury to people and damage to property. With regards to the issue related to loss data, the below table shows NFPA records of historical fire data.

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Number of deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consolidated School</td>
<td>March 18, 1937</td>
<td>294</td>
</tr>
<tr>
<td>Lakeview School</td>
<td>March 4, 1908</td>
<td>175</td>
</tr>
<tr>
<td>Our Lady of the Angels School</td>
<td>December 1, 1958</td>
<td>95</td>
</tr>
<tr>
<td>(<a href="http://www.nfpa.org/~media/files/research/fire-investigations/ladyofangels.pdf?la=en">http://www.nfpa.org/~media/files/research/fire-investigations/ladyofangels.pdf?la=en</a>) (PDF, 1 MB) Chicago, IL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Cleveland School</td>
<td>May 17, 1923</td>
<td>77</td>
</tr>
<tr>
<td>School Name</td>
<td>Date</td>
<td>Number</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>---------------</td>
<td>--------</td>
</tr>
<tr>
<td>Bath Consolidated School</td>
<td>May 18, 1927</td>
<td>46</td>
</tr>
<tr>
<td>Babbs Switch School</td>
<td>December 24, 1924</td>
<td>32</td>
</tr>
<tr>
<td>St. John's Parochial School</td>
<td>October 28, 1915</td>
<td>21</td>
</tr>
<tr>
<td>Cleveland Hill School</td>
<td>March 31, 1954</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: NFPA Historical Records

Regarding the cost impact, AFSA details that sprinklers account for approximately 1-2% of the total construction cost of buildings. Therefore, the overall cost impact to install a sprinkler system in a school is relatively minor.

F157-16
Proposed Change as Submitted

Proponent: Jeff Hugo, National Fire Sprinkler Association, representing National Fire Sprinkler Association (hugo@nfsa.org)

2015 International Fire Code

903.2.3 Group E. An automatic sprinkler system shall be provided for Group E occupancies as follows:
1. Throughout all Group E fire areas greater than 12,000 square feet (1115 m²).
2. Throughout all Group E occupancies that are designated as a community storm shelter in accordance with Section 423 of the International Building Code.
3. Throughout every portion of educational buildings below the lowest level of exit discharge serving that portion of the building.

Exception: An automatic sprinkler system is not required in any area below the lowest level of exit discharge serving that area where every classroom throughout the building has not fewer than one exterior exit door at ground level.

Reason: The main purpose of this proposal is to provide a baseline for safe schools, but remain flexible for communities. Schools are often the neighboring community shelter that become the community center after a disaster. Schools have also become targets for many active shooters that target innocent students and citizens.
Public schools are often used as a public shelter, before or after a tornado, hurricane, flood, wildfire, etc. Some states require new schools be built as public shelters. In many emergencies, natural or man-made disasters, a school becomes the center for several temporary occupancies that provide emergency services, such as; cooking, nursing, surgery, psychiatric, along with housing, to area residents. All of these emergency uses, if built separately, require fire sprinkler systems installed.
The “NFPA School Safety, Codes and Security Workshop” report from December of 2014 makes several suggestions to improve school safety and security. Several areas of the report suggest improving school safety with fire sprinklers. One of the more convenient and inexpensive security measures to thwart active shooters is locking devices. While there are several positive attributes with these devices, the purpose is to delay egress. A procedure that holds students and staff in a room or area that prevents egress after a fire alarm activation is a concept contrary to the intent of this code and other life safety codes.
The only reasonable counter measure for delayed egress is have an active fire protection system. Fire sprinklers are the most cost effective fire protection system.

Schools are a significant investment by the community, state and federal government. Losing modern day schools through fire is irresponsible. This proposal attempts to balance life safety features by providing safer schools with increased active or passive fire protection. The 4,500 square feet fire area is based on 300 occupants (A-3 occupancy that the gymnasium/cafeteria often is) multiplied by 15 square feet per person. This provides a higher compartmented building that becomes more manageable to the first responders and supports delayed egress more than the current 12,000 square feet fire area. Having a smaller fire area would increase construction costs, but it would accommodate rural areas that may not have readily available water supplies.

Cost Impact: Will increase the cost of construction
Having a smaller fire area would increase construction costs, but it would accommodate rural areas that may not have readily available water supplies.

Public Hearing Results

Committee Action: Disapproved
Committee Reason: The committee stated that the current code section requirements are adequate and the new requirements are unnecessary and overly restrictive without substantiation.

Assembly Motion: As Submitted
Online Vote Results: Successful
Support: 60.12% (312) Oppose: 39.88% (207)
Assembly Action: Approved as Submitted
Individual Consideration Agenda

Public Comment 1:

Proponent: Jeff Hugo, representing National Fire Sprinkler Association (hugo@nfsa.org) requests Approve as Modified by this Public Comment.

Modify as follows:

2015 International Fire Code

903.2.3 Group E. An automatic sprinkler system shall be provided for Group E occupancies as follows:

1. Throughout all Group E fire areas greater than 4,500 square feet in area.
2. Throughout all Group E occupancies that are designated as a community storm shelter in accordance with Section 423 of the International Building Code.
3. Throughout every portion of educational buildings below the lowest level of exit discharge serving that portion of the building.

Exceptions: An automatic sprinkler system is not required in any area below the lowest level of exit discharge serving that area where every classroom throughout the building has not fewer than one exterior exit door at ground level.

Commenter's Reason: Schools today are evolving. The traditional school occupancy classification of K-12 students remains the same but the treatment of the occupants in times of emergency has expanded. The school today has a frequent condition called "lockdown". During lockdown, students and teachers remain in the locked classroom and are prohibited to leave. Lockdowns are more common than most citizens would think. Everyone sees or hears about the school lockdown when a weapon is discovered near or on school property, or when there is an act of violence on or near school property. However, schools lockdowns are common for kids to hear and experience. It is the command of school administrators to contain a school or protect from an outside threat (http://bnonews.com/news/index.php/news/id4499) , real or perceived. Lockdowns are declared when a divorced parent with a protection order shows up to see a child unannounced, or when a black bear is sighted (http://www.wlky.com/news/Black-bear-sighting-prompts-Danville-school-lockdown/40205168) or http://www科研院.co.uk/news/article-3597494/Bear-causes-ruckus-Southern-California-foothill-suburb.html (http://www科研院.co.uk/news/article-3597494/Bear-causes-ruckus-Southern-California-foothill-suburb.html), or when protesters are outside( http://www.examiner.co.uk/news/west-yorkshire-news/christian-school-lockdown-over-cross-11544295 ) or when a creeper is in the woods, and on and on. The point is, the students are detained and exiting is not an option.

What happens when a school or schools are locked down and the newly formed public safety department (joint police and fire) officers are busy and a real fire breaks out? When alarms sound, students today are not evacuating but, in fact, some school districts and state agencies specifically tell students to ignore fire alarms (http://www.freerangekids.com/school-when-fire-alarm-rings-lock-yourselves-in-it-could-really-be-a-shooter/). The model that protects students who are "sheltered-in-place" is based on institutional occupancies. The code development process has developed door hardware and other modifications to the IBC, IFC, and IEBC to accommodate and protect, but the process has not tackled the fire protection issue as it has with institutional occupancies. When fire alarms are ignored and students are crouched in a corner of a room, and do not or can not respond to any commands at the door; what protects the students when there is a fire?

When schools start to resemble institutional occupancies, then the fire and life safety requirements of institutional occupancies need to be applied to educational occupancies. This proposal provides increased fire protection that is flexible to every community and school district.

Unsprinklered schools with 12,000 sq.ft fire area can have from 240-600 students per fire area. This proposal would have a range of 90 to 225, well below other sprinkler thresholds as for example in unsprinklered assembly occupancies. The proposal also has a sprinklered option, that more closely resembles the institutional occupancy. However, an educational occupancy is not an assembly occupancy or institutional occupancy, so, this proposal provides options that mitigates.

This proposal has majority support from the assembly motion vote.

Public Comment 2:

Proponent: Jeff Hugo, representing National Fire Sprinkler Association (hugo@nfsa.org) requests Approve as Modified by this Public Comment.
Modify as follows:

**2015 International Fire Code**

903.2.3 Group E. An automatic sprinkler system shall be provided for Group E occupancies as follows:

1. Throughout all Group E fire areas greater than 4,500 square feet in area.
2. Throughout all Group E occupancies that are designated as a community storm shelter in accordance with Section 423 of the International Building Code.
3. Throughout the Group E occupancy designated storm shelter in accordance with Section 423 of the International Building Code with an occupant load of 300 or more.
4. Throughout every portion of educational buildings below the lowest level of exit discharge serving that portion of the building.
   - **Exception:** An automatic sprinkler system is not required in any area below the lowest level of exit discharge serving that area where every classroom throughout the building has not fewer than one exterior exit door at ground level.

**Commenter's Reason:** The 2015 IBC Section 423.4 requires the entire E occupant load to fit within the storm shelter. In EB68-15 Part II, the occupant load of the E occupancy storm shelter expands to all buildings on site. This public comment would require fire sprinklers in the storm shelter when the threshold of 300 occupants is exceeded in the storm shelter. The 300 occupant threshold is the same as several assembly occupancy requirements. The size of the storm shelter does not trigger the fire sprinkler requirement unless it exceeds 12,000 square feet.

Shelters, as explained in the previous reason statement, resemble assembly occupancies (as well as institutional and residential) in times of emergency. How the occupant load is determined comes from EB68-15. It uses the total occupant load of the classrooms, vocational rooms and offices in the Group E occupancy or the occupant load of any indoor assembly space that is associated with the Group E occupancy.

This proposal received majority support from the assembly motion vote.

**Proponent:** Assembly Motion requests Approve as Submitted.

**Commenter's Reason:** This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly motion. The assembly action for Approve as Submitted was Successful by a vote of 60.12% (312) to 39.88% (207) by eligible members online during the period of May 11 - May 26, 2016.
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. A Group M fire area exceeds 12,000 square feet (1115 m²).
2. A Group M fire area is located more than three stories above grade plane.
3. The combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²).
4. A Group M occupancy fire area used for the display and sale of upholstered furniture or mattresses exceeds 5,000 square feet (464 m²).

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 m²).
2. A Group S-1 fire area is located more than three stories above grade plane.
3. The combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²).
4. A Group S-1 fire area used for the storage of commercial motor vehicles where the fire area that exceeds 5,000 square feet (464 m²).
5. A Group S-1 occupancy used for the storage of upholstered furniture or mattresses exceeds 2,500 square feet (232 m²).
6. A Group S-1 occupancy fire area used for the storage of upholstered furniture or mattresses that exceeds 2,500 square feet (232 m²) with the exception of a self-service storage facility.

Reason: Based upon IFC Interpretation 20-14, any Group S-1 Occupancy over 2,500 sf where mattresses or upholstered furniture are present is required to be sprinklered. This interpretation states “This is regardless of how much upholstered furniture and/or mattresses are actually stored.” From this a small self-storage location where household goods including incidental pieces of upholstered furniture or mattress are stored would be required to be sprinklered. In areas used for the storage of upholstered furniture and mattresses there is a significant increase in fire loading when compared to other S-1 storage, in small-storage locations where these materials are typically incidental the fire loading would be substantially the same as all other S-1 storage so this would appear to be an unnecessary burden upon these locations. The change of the word occupancy to fire area for both Group M and S-1 is to correlate it with the other requirements in the section and clarify how this section is to be enforced as fire area is a defined term where as occupancy is not.

Cost Impact: Will not increase the cost of construction
This proposal would not require sprinklers in areas where the current code would require them, leading to a reduction in construction costs in these locations.

Committee Reason: The committee stated that the existing section should be left using the term “occupancy” and that by adding the words “fire area” it causes the intent of the existing section to change in an unacceptable way. In addition, the exception and application to self-storage facilities was unacceptable.

Assembly Action: None
Proponent: William King, City of Alexandria, representing VBOCA (william.king@alexandriava.gov) requests Approve as Submitted.

Commenter's Reason: The lack of clarity in the current language with the use of the term "occupancy" vs "fire area" does have a significant impact on enforcement. Currently, Item 4 under 903.2.7 notes that "A Group M occupancy .... exceeds 5,000 sf." This would appear to allow individual non-separated Group M occupancies under the threshold to be located in an individual fire area up to the requirements of Item 1 (12,000 sf) without being sprinklered. A similar issue would exist for Group S-1.

Even if the occupancy separation provisions were to be used, which would clearly create separate occupancies, all that would be required is an unrated wall between the M and/or S-1 occupancies per Table 508.4.

This change is to clarify and make more enforceable the provisions that have already been changed from the original basis for their creation. The committee in their original approval of F135 during the 07/08 cycle noted "that a reasonable sprinkler threshold needs to be added to provide some relief to small businesses" and that the term "primarily" was removed to prevent "serious enforcement inconsistencies."

Keeping the language occupancy in this manner creates those exact inconsistencies as it is not a defined term and as outlined above and applying it to unrated walls would clearly create a separated mixed use building under section 508.4.

The committee further noted in F69-09/10 that the intent of the change to add the square footage limitations to the F-1, M and S-1 thresholds was to "provide a reasonable threshold that would not penalize occupancies with very small amounts of such materials." This proposed change is designed to ensure that at these thresholds, the use of Fire Area will ensure that the separation of occupancies or spaces to reduce them below the sprinklering threshold will be created with rated, not unrated, construction.

The exclusion of self-storage facilities is to acknowledge that while upholstered furniture or mattresses will be stored in these uses, the typical construction of these facilities consists of each space under the control of individual customers.
Proposed Change as Submitted

Proponent: Ali Fattah, City of San Diego Development Services Department (afattah@sandiego.gov)

2015 International Fire Code

Add new text as follows:

903.3.1.1.3 Detached non-combustible canopies. Sprinklers shall not be required to protect detached non-combustible exterior canopies located adjacent to buildings protected with a sprinkler system where all of the following conditions are satisfied:

1. The canopy shall be supported directly on grade.
2. Canopies shall be located not less than 10 ft. from an adjacent canopy, lot line or building.
3. Canopies shall not cover a fire area with more than 750 sq. ft. (46.45 m²).
4. Canopies shall not be used for storage or to cover high-piled stock or rack storage.
5. Canopies shall have all sides fully open.
6. Canopies shall be covered with materials permitted in Section 3105 or non-combustible materials.

Reason: The IBC is silent in regards to omission of fire sprinklers from beneath canopies or beneath canopies located at fire separation distances less than 10 feet. This proposed code change addresses a condition commonly found in restaurants with exterior patios where outdoor covered exterior dining areas are provided as well as adjacent to office buildings and retail buildings. Canopies are not considered buildings, however they contribute to fire area when located closer than a fire separation distance of 20 feet. These areas are generally not surrounded with walls and cover portions of exterior dining areas.

When Section 903.2.1.2 was modified in the 2009 IBC to require fire sprinklers when the occupant load in the Group A-2 fire area is 100 or more, many drinking or dining establishments are protected with sprinklers. As a result exterior accessory structures such as canopies not located at a fire separation distance of 20 ft relative to the main building require protection. NFPA 13 is silent on this issue. This will require an underground water supply line beneath the patio to extend sprinkler protection to the exterior canopy which can be onerous. Many restaurants as a result provide umbrellas (fixed or portable) or create trellises that they later cover to not extend the protection.

Additionally, canopies located within a yard used for frontage in unlimited area buildings are also required to be protected with a fire sprinkler system when located less than 40 ft from a very large building. The reason is that the IBC considers that the canopy contributes to the fire load in the unlimited area building and therefore poses a risk to the building if not protected.

The proposal will result in a canopy that is about 22 ft by 22 ft with occupants generally located within 11 ft from the exterior of the canopy. Unlike when occupants are located within an enclosed building, occupants under the canopy do not have to search for exits by looking at exit signs, pass through corridors and then reach exterior doors. Occupants will be a few steps away from the exterior.

The proposed code change includes restrictions on the size and construction of the canopy to reduce the fire exposure from the construction of the canopy and to allow a short distance for occupants to egress from under the canopy. Additionally the proposed code change prohibits storage under a non-protected canopy and requires that the canopy be at least 10 ft from buildings, lot lines and other canopies.

Cost Impact: Will not increase the cost of construction

The cost of construction will not change since many Code Officials seem to consider the space between a canopy and a protected building however small to be a break in the fire area. The proposed code change provides a basis addressing the actual issue through the code rather than through interpretation.

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The committee stated that the proposed conditions are not consistent with NFPA 13 and vehicle fueling is not addressed. In addition there was objection to the use of “fire area” in condition 3.
Public Comment 1:

Proponent: Ali Fattah, City of San Diego Development Services Department, representing City of San Diego Development Services Department (afattah@sandiego.gov) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

903.3.1.1.3 Detached non-combustible exterior canopies. Sprinklers shall not be required to protect detached non-combustible exterior canopies located adjacent to buildings protected with a sprinkler system where all of the following conditions are satisfied:

1. The canopy shall be supported directly on grade.
2. Canopies shall be constructed of non-combustible construction, or Type IV construction in accordance with Section 602.4.
3. Canopies shall be located not less than 10 ft. from an adjacent canopy, lot line or building.
4. Canopies shall not cover a fire area with more than 750 sq. ft. (46.45 m²).
5. Canopies shall not be used for storage or to cover high-piled stock or rack storage.
6. Canopies shall have all sides fully open.
7. Canopies shall be covered with materials permitted in Section 3105 or non-combustible materials.

Commenter’s Reason: This public comment addresses most of the concerns raised at the CAH. The debate highlighted inconsistent application of sprinkler requirements for both detached and attached canopies even though the proposed code change only addresses the former in a very limited way. This code change is not intended to address issues of installations where freezing is a concern nor how NFPA 13 requires water supply to be provided to detached limited area sprinklers. This code change seeks to exempt coverage from areas that do not pose a life safety risk due to the activities of the occupants under the canopy. Additionally the code change also seeks to address the benefits of openness and fire separation afforded by the canopies that minimize the risk to adjacent buildings.

Furthermore we received negative comments on the restriction in the code change, as originally proposed, that the canopy be constructed of non-combustible construction since Section 1406.3 of the IBC permits 50% of the perimeter of a building to be constructed with type IV construction and permits no limit when the building and canopy are protected with an automatic fire sprinkler system. Section 1406.3 does not limit the depth (perpendicular to building face) of the canopy nor does it require sprinkler protection. Sprinkler protection is required per the requirements of Ch 5 and 9 of the IBC. While not surrounding a building the limited size of the canopies is similar to what the ch 14 is intending to address.

We also appreciated the committee’s comment that the proposed code change does not restrict the application of the requirement above motor-fuel dispensing areas. While it is difficult to imagine when a building located adjacent to a pump canopy in a fueling facility requires sprinkler protection, we added condition 6 to address it.

If this code change is not approved, the code will continue to require fire sprinkler protection of canopies that can not be considered separate buildings due to fire separation distances of 20 ft or 30 ft (depending on type of construction of the main building). Additionally some jurisdictions will continue to exempt protection of the canopies will result in the persistence of inconsistent code application as was evident from the testimony at the CAH hearing.

Public Comment 2:

Proponent: Ali Fattah, City of San Diego Development Services Department, representing City of San Diego Development Services Department (afattah@sandiego.gov) requests Approve as Modified by this Public Comment.

Further Modify as Follows:

2015 International Fire Code

903.3.1.1.3 Detached non-combustible canopies. Sprinklers shall not be required to protect detached non-combustible exterior canopies located adjacent to buildings protected with a sprinkler system where all of the following conditions are...
satisfied:
1. The canopy shall be supported directly on grade.
2. Canopies shall be located not less than 10 ft. from an adjacent canopy, lot line or building.
3. Canopies shall not cover a fire area with more than 750 sq. ft. (46.45 m²).
4. Canopies shall not be used for storage or to cover high-piled stock or rack storage.
5. Canopies shall not cover areas used for motor fuel-dispensing.
6. Canopies shall have all sides fully open.
7. Canopies shall be covered with materials permitted in Section 3105 or non-combustible materials.

Commenter's Reason: This public comment addresses most of the concerns raised at the CAH. The debate highlighted inconsistent application of sprinkler requirements for both detached and attached canopies even though the proposed code change only addresses the former in a very limited way. This code change is not intended to address issues of installations where freezing is a concern nor how NFPA 13 requires water supply to be provided to detached limited area sprinklers. This code change seeks to exempt coverage from areas that do not pose a life safety risk due to the activities of the occupants under the canopy. Additionally the code change also seeks to address the benefits of openness and fire separation afforded by the canopies that minimize the risk to adjacent buildings.

Furthermore we received negative comments on the restriction in the code change, as originally proposed, that the canopy be constructed of non-combustible construction since Section 1406.3 of the IBC permits 50% of the perimeter of a building to be constructed with type IV construction and permits no limit when the building and canopy are protected with an automatic fire sprinkler system. Our intended code change was meant to limit the combustibility of the canopy so as not to contribute to the fire load of the canopy, and therefore the fire load of the potentially exposed building. We submitted two public comments to ascertain the wishes of the ICC membership due to the somewhat contradictory testimony by opponents to the original code change during the CAH.

We also appreciated the committee's comment that the proposed code change does not restrict the application of the requirement above motor-fuel dispensing areas. While it is difficult to imagine when a building located adjacent to a pump canopy in a fueling facility requires sprinkler protection, we added condition 6 to address it.

If this code change is not approved, the code will continue to require fire sprinkler protection of canopies that can not be considered separate buildings due to fire separation distances of 20 ft or 30 ft (depending on type of construction of the main building). Additionally some jurisdictions will continue to exempt protection of the canopies will result in the persistence of inconsistent code application as was evident from the testimony at the CAH hearing.
Proposed Change as Submitted

Proponent: William Hall, Portland Cement Association (jhall@cement.org)

2015 International Fire Code

903.3.1.2 NFPA 13R sprinkler systems. *Automatic sprinkler systems* in Group R occupancies up to and including four stories in height in buildings not exceeding 60 feet (18 288 mm) in height above grade plane shall be permitted to be installed throughout in accordance with NFPA 13R.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 of the *International Building Code* shall be measured from the horizontal assembly creating separate buildings.

903.3.1.2.1 Balconies and decks. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of *dwelling units* and *sleeping units* where the building is of Type V construction, provided there is a roof or deck above. Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

903.3.1.2.2 Open-ended corridors. Sprinkler protection shall be provided in *open-ended corridors* and associated *exterior stairways* and ramps as specified in Section 1027.6, Exception 3.

Add new text as follows:

903.3.1.2.3 Attics. Sprinkler protection shall be provided in attics that are used or intended for living purposes or storage or that contain fuel-fired equipment.

Other attics, where located in buildings of Type III, IV or Type V construction that have a roof assembly located more than 45 feet (16 764 mm) above the lowest level of required fire department vehicle access, shall comply with one of the following:

1. Attics provided with sprinkler protection.
2. Attics constructed of noncombustible materials.
3. Attics constructed of fire-retardant-treated wood complying with Section 2303.2.
4. Attics filled with noncombustible insulation.

The height of the roof assembly shall be determined by measuring the distance from the lowest required fire vehicle access road surface adjacent to the building to either the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance. Required fire vehicle access roads shall only include roads that are necessary for compliance with IFC Section 503.

**Reason:** This proposal was developed to address fire service concerns of un-protected combustible attic spaces greater than 45 feet. While NFPA 13R would still be permitted to protect residential structures up to 60 ft., sprinkler protection or other approved methods correlating with NFPA 13 would be required in the attic spaces when roof heights exceed 45 ft. from the required lowest level of fire dept access.

**Cost Impact:** Will increase the cost of construction

This proposal will increase the cost of construction by requiring sprinkler protection in combustible attic spaces over 45 feet in height.

Committee Action: Disapproved

Committee Reason: The committee stated that the preference was for the revisions that were approved in coe change proposal F172-16.

Assembly Action: None
**Individual Consideration Agenda**

Proponent: William Hall, representing Portland Cement Association (jhall@cement.org) requests Approve as Submitted.

**Commenter's Reason:** F172-16 was passed by committee to lower the height at which NFPA 13R can be installed and used to protect the structure. Until the roof structure is over 10 ft. tall from attic floor to top of ridge, this change has no affect. Current code permits 13R installations where mean roof height is 60 ft. This proposal would lower the limit to 50 ft. to the roof eaves and provide a 10 ft. reduction overall in tall buildings protected with a NFPA 13R system.

F168-16
Proposed Change as Submitted

Proponent: William Hall, Portland Cement Association (jhall@cement.org)

2015 International Fire Code

Revise as follows:

903.3.1.2.1 Balconies and decks. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of dwelling units and sleeping units where the building is of Type V construction, provided there is a roof or deck above. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of dwelling units and sleeping units where the building is of Type III and IV construction and where there is a combustible balcony, roof or deck above. Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

Reason: IBC Section 1406.3 exception #3 permits combustible balconies and decks on the exterior walls of Type III, IV and V construction only if sprinkler protection is extended out to these areas. This proposal brings forth the exception and places it within the Balconies and Decks section located in Chapter 9 section 903.3.1.2.1. A fire which begins on a combustible balcony or deck has the same propensity to spread vertically and involve several floors at the same time, overwhelming a sprinkler system while fire continues to spread up the building regardless of construction type. Vertical fire from the balcony or deck can run up to the combustible roof which may not have sprinkler protection in the attic. Construction Types I and II allow fire retardant treated wood or Heavy Timber for three stories or less.

IBC Section 1403 (Shown for reference only)

1406.3 Balconies and similar projections. Balconies and similar projections of combustible construction other than fire-retardant treated wood shall be fire-resistance rated where required by Table 601 for floor construction or shall be of Type IV construction in accordance with Section 602.4. The aggregate length of the projections shall not exceed 50 percent of the building's perimeter on each floor.

Exceptions:
1. On buildings of Type I and II construction, three stories or less above grade plane, fire-retardant treated wood shall be permitted for balconies, porches, decks and exterior stairways not used as required exits.
2. Untreated wood is permitted for pickets and rails or similar guardrail devices that are limited to 42 inches (1067 mm) in height.
3. Balconies and similar projections on buildings of Type III, IV and V construction shall be permitted to be of Type V construction, and shall not be required to have a fire-resistance rating where sprinkler protection is extended to these areas.

A fire which begins on a combustible balcony or deck has the same propensity to spread vertically and involve several floors at the same time, overwhelming a sprinkler system while fire continues to spread up the building regardless of construction type. Vertical fire from the balcony or deck can run up to the combustible roof which may not have sprinkler protection in the attic. Construction Types I and II allow fire retardant treated wood or Heavy Timber for three stories or less.

Cost Impact: Will not increase the cost of construction

This proposal does not add any new requirements and therefore will not increase the cost of construction.
Committee Action: Disapproved

Committee Reason: The committee stated that the new proposed text is confusing and does not clearly state the requirement.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Jeffrey Shapiro, International Code Consultants, representing National Multifamily Housing Council (jeff.shapiro@intlcodeconsultants.com); William Hall, Portland Cement Associations, representing Portland Cement Association (jhall@cement.org) requests Approve as Modified by this Public Comment.

Replace Proposal as Follows:

2015 International Fire Code

903.3.1.2.1 Balconies and decks. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of dwelling units and sleeping units where the:

1. The building is of Type V construction, provided there is a roof or deck above, or
2. Exterior balconies, decks and ground floor patios of dwelling units and sleeping units are constructed in accordance with Section 1406.3 exception 3 of the International Building Code.

Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

2015 International Building Code

[F] 903.3.1.2.1 Balconies and decks. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of dwelling units and sleeping units where the:

1. The building is of Type V construction, provided there is a roof or deck above, or
2. Exterior balconies, decks and ground floor patios of dwelling units and sleeping units are constructed in accordance with Section 1406.3 exception 3.

Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

Commenter's Reason: Correlation with the balcony sprinkler requirements in Section 1406.3 Ex. 3

Proponent: Thomas Daly, representing American Hotel & Lodging Association (tom.daly@thehscg.com) requests Disapprove.

Commenter's Reason: The Fire Code Committee's action is correct in several respects. The proposed change based solely on construction type, ignores the difference in potential fuel loads on balconies based on occupancy type. For example, apartment balconies may have fuel loads different from hotel balconies. Further no substantial fire record was provided to indicate this is a problem. The proposed change would present a significant cost increase for the installation of additional sprinklers without adequate substantiation. The proposed change should continue to be disapproved.

Thomas G. Daly MSc. CSP
Principal
The Hospitality Security Consulting Group, LLC
Representing the American Hotel & Lodging Association
Proposed Change as Submitted

Proponent: Jeffrey Shapiro, representing National Multifamily Housing Council (jeff.shapiro@ntlcodeconsultants.com); Michael O'Brian representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code

903.3.1.2 NFPA 13R sprinkler systems. Automatic sprinkler systems in Group R occupancies up to and including four stories in height in buildings not exceeding 60 feet (18288 mm) in height above grade plane shall be permitted to be installed throughout in accordance with NFPA 13R.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 of the International Building Code shall be measured from the horizontal assembly creating separate buildings.

Add new text as follows:

903.3.1.2.1 Balconies and decks. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of dwelling units and sleeping units where the building is of Type V construction, provided there is a roof or deck above. Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

903.3.1.2.2 Open-ended corridors. Sprinkler protection shall be provided in open-ended corridors and associated exterior stairways and ramps as specified in Section 1027.6, Exception 3.

903.3.1.2.3 Attics Attic protection shall be provided as follows:

1. Attics that are used or intended for living purposes or storage shall be protected by sprinklers.

2. Where fuel-fired equipment is installed in an unsprinklered attic, at least one quick-response intermediate temperature sprinkler shall be installed above the equipment.

3. Where located in a building of Type III or Type V construction designed in accordance with Section 510.2 or Section 510.4 of the International Building Code, attics not required by Item 1 to have sprinklers shall comply with one of the following if the roof assembly is located more than 55 feet (16764 mm) above the lowest level of required fire department vehicle access:
   a. Provide sprinkler protection.
   b. Construct the attic using noncombustible materials.
   c. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the International Building Code.
   d. Fill the attic with noncombustible insulation.

The height of the roof assembly shall be determined by measuring the distance from the lowest required fire vehicle access road surface adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance. For the purpose of this measurement, required fire vehicle access roads shall include only those roads that are necessary for compliance with Section 503.

4. Group R-4 Condition 2 occupancy attics not required by Item 1 to have sprinklers shall comply with one of the following:
   a. Provide sprinkler protection.
   b. Provide a heat detector system throughout the attic that is arranged to activate the building fire alarm system in accordance with Section 907.2.10.
   c. Construct the attic using noncombustible materials.
   d. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the International Building Code.
   e. Fill the attic with noncombustible insulation.

Revise as follows:

[F] 903.2.8.3 Group R-4 Condition 2. An automatic sprinkler system installed in accordance with Section 903.3.1.2 shall be permitted in Group R-4 Condition 2 occupancies. Attics shall be protected in accordance with Section 903.2.8.3.1 or 903.2.8.3.2.

Delete without substitution:
Committee Action: Approved as Modified

Modification:

903.3.1.2.3 Attics. Attic protection shall be provided as follows:

1. Attics that are used or intended for living purposes or storage shall be protected by sprinklers.
2. Where fuel-fired equipment is installed in an unsprinklered attic, at least one quick-response intermediate temperature sprinkler shall be installed above the equipment.

3. Where located in a building of Type III, Type IV or Type V construction designed in accordance with Section 510.2 or Section 510.4 of the International Building Code, attics not required by Item 1 to have sprinklers shall comply with one of the following if the roof assembly is located more than 55 feet (16 764 mm) above the lowest level of required fire department vehicle access:
   a. Provide sprinkler protection.
   b. Construct the attic using noncombustible materials.
   c. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the International Building Code.
   d. Fill the attic with noncombustible insulation.

The height of the roof assembly shall be determined by measuring the distance from the lowest required fire vehicle access road surface adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance. For the purpose of this measurement, required fire vehicle access roads shall include only those roads that are necessary for compliance with Section 503.

4. Group R-4 Condition 2 occupancy attics not required by Item 1 to have sprinklers shall comply with one of the following:
   a. Provide sprinkler protection.
   b. Provide a heat detector system throughout the attic that is arranged to activate the building fire alarm system in accordance with Section 907.2.10.
   c. Construct the attic using noncombustible materials.
   d. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the International Building Code.
   e. Fill the attic with noncombustible insulation.

Committee Reason: Approval is based upon the proponent's published reason. The modification was approved because it was desired by the committee to extend the new requirements to Type IV in addition to Types III and V construction buildings.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Robert Davidson, representing Self (rjd@davidsoncodeconcepts.com) requests Approve as Modified by this Public Comment.

Further Modify as Follows:

2015 International Fire Code

903.1.2.3 Attics Attic protection shall be provided as follows:
   1. Attics that are used or intended for living purposes or storage shall be protected by sprinklers.

2. Where fuel-fired equipment is installed in an unsprinklered attic, at least one quick-response intermediate temperature sprinkler shall be installed above the equipment.

3. Where located in a building of Type III, Type IV or Type V construction designed in accordance with Section 510.2 or Section 510.4 of the International Building Code, attics not required by Item 1 to have sprinklers shall comply with one of the following if the roof assembly is located more than 55 feet (16 764 mm) above the lowest level of required fire department vehicle access:
   a. Provide sprinkler protection.
   b. Construct the attic using noncombustible materials.
   c. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the International Building Code.
   d. Fill the attic with noncombustible insulation.

The height of the roof assembly shall be determined by measuring the distance from the lowest required level of fire department vehicle access road surface adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance. For the purpose of this measurement, required fire vehicle access roads shall include only those roads that are necessary for compliance with Section 503.
4. Group R-4 Condition 2 occupancy attics not required by Item 1 to have sprinklers shall comply with one of the following:
   a. Provide sprinkler protection.
   b. Provide a heat detector system throughout the attic that is arranged to activate the building fire alarm system in accordance with Section 907.2.10.
   c. Construct the attic using noncombustible materials.
   d. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the International Building Code.
   e. Fill the attic with noncombustible insulation.

Commenter's Reason: The purpose of this public comment is to eliminate two triggers contained within the initial proposal that severely limit application of the necessary improvement to the code requirements dealing with Type III, Type IV or Type V construction building protected by NFPA 13R sprinkler systems. The initial proposal reason statement states:

“This proposal is recommended as a response to fire-service concerns about suppressing a fire involving a tall pedestal building attic. Such attic or attics will be required to have increased fire protection. The proposed threshold is modeled after a combination of two existing code sections, Appendix D Section 105.1 (which establishes requirements for aerial ladder access based on attic height) and Section 903.2.11.3 (which uses 55 feet as a building height threshold related to sprinklers).”

The initial statement is incorrect in that the problem identified, (NFPA 13R protected buildings with concealed combustible space attics being destroyed once a fire reaches the attic), is not limited to tall pedestal buildings. The problem includes buildings not utilizing the pedestal design option. From a fire protection standpoint there is no difference in the fire potential for rapid spread and destruction of the building when a fire reaches an attic 55 feet above the lowest level of fire department access whether or not the building sits upon a pedestal, the fire is still at that 55 foot level.

The proponent indicates the proposal was developed by combining the concepts found within two code sections, one of those being Section D105.1 which applies to the need for aerial ladder fire apparatus access roads.

"D105.1 Where required.
Where the vertical distance between the grade plane and the highest roof surface exceeds 30 feet (9144 mm), approved aerial fire apparatus access roads shall be provided. For purposes of this section, the highest roof surface shall be determined by measurement to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of parapet walls, whichever is greater."

Note that in Section D105.1 the height is measured from grade plane, (not from a fire apparatus access road), this is important because it is tied to the ability to deploy ground ladders and hand hose streams to combat a fire; and Section D105.1 uses a height of 30 feet which is a concept long contained within the code when assessing the ability to effectively use ground ladders and hand hose lines to combat fire as a trigger for standpipe installations.

"905.3.1 Height.
Class III standpipe systems shall be installed throughout buildings where the floor level of the highest story is located more than 30 feet (9144 mm) above the lowest level of the fire department vehicle access, or where the floor level of the lowest story is located more than 30 feet (9144 mm) below the highest level of fire department vehicle access.

Exceptions:
1. Class I standpipes are allowed in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Class I manual standpipes are allowed in open parking garages where the highest floor is located not more than 150 feet (45 720 mm) above the lowest level of fire department vehicle access.
3. Class I manual dry standpipes are allowed in open parking garages that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.
4. Class I standpipes are allowed in basements equipped throughout with an automatic sprinkler system.
5. In determining the lowest level of fire department vehicle access, it shall not be required to consider either of the following:
   5.1. Recessed loading docks for four vehicles or less.
   5.2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible."

These core concepts involving the impact of height on the ability to effectively deploy hand hose lines to combat fire do not change based upon the existence of a pedestal.
The proposed modification eliminates the reference to pedestal building construction, "designed in accordance with Section 510.2 or Section 510.4 of the International Building Code"; 55 feet above grade is 55 feet above grade regardless of whether or not there is an intervening pedestal. The rapidly spreading fire is 55 feet high and out of reach of effective ground ladder hose stream application.

The proposed modification also eliminates reference to "required" fire department vehicle access pursuant to "Section 503" and replaces those references with "lowest level of fire department vehicle access" which matches the existing fire protection concept dealing with the application of hand hose streams in both Sections 905.3.1 and D105.1. Whether or not there is a "required" fire apparatus access road does not change the impact of the height above whatever access will be provided on the proposed site. In addition, many fire departments are not part of the site design and approval process and do not have authority to require "designated fire apparatus access roads" on an approved site, they must rely on whatever paved areas that have been provided for routine motor vehicle traffic and parking.

Eliminating the two intentionally restrictive triggers will ensure that the "solution" proposed will apply to any building utilizing Type III, Type IV or Type V construction once the height of the roof assembly reaches the 55 foot level creating a concealed combustible space attic.

Note: Even with these suggested changes the resulting language will use a height trigger 15 feet higher than the currently recognized 30 feet contained within the code dealing with the concept of height versus application of hand hose streams.

Public Comment 2:

Proponent: William Hall, representing Portland Cement Association (jhall@cement.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

903.3.1.2.3 Attics Attic protection shall be provided as follows:

1. Attics that are used or intended for living purposes or storage shall be protected by sprinklers.

2. Where fuel-fired equipment is installed in an unsprinklered attic, at least one quick-response intermediate temperature sprinkler shall be installed above the equipment.

3. Where located in a building of Type III, Type IV or Type V construction designed in accordance with Section 510.2 or Section 510.4 of the International Building Code, attics not required by Item 1 to have sprinklers shall comply with one of the following if the roof assembly is located more than 55 50 feet (16 764 15 240 mm) above the lowest level of required fire department vehicle access:
   a. Provide sprinkler protection.
   b. Construct the attic using noncombustible materials.
   c. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the International Building Code.
   d. Fill the attic with noncombustible insulation.
   The height of the roof assembly shall be determined by measuring the distance from the lowest required fire vehicle access road surface adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance. For the purpose of this measurement, required fire vehicle access roads shall include only those roads that are necessary for compliance with Section 503.

4. Group R-4 Condition 2 occupancy attics not required by Item 1 to have sprinklers shall comply with one of the following:
   a. Provide sprinkler protection.
   b. Provide a heat detector system throughout the attic that is arranged to activate the building fire alarm system in accordance with Section 907.2.10.
   c. Construct the attic using noncombustible materials.
   d. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the International Building Code.
   e. Fill the attic with noncombustible insulation.
Commenter's Reason: F172-16 was passed by committee to lower the height at which NFPA 13R can be installed and used to protect the structure. Until the roof structure is over 10 ft. tall from attic floor to top of ridge, this change has no affect. Current code permits 13R installations where mean roof height is 60 ft. This proposal would lower the limit to 50 ft. to the roof eaves and provide a 5 ft. reduction overall in tall buildings protected with a NFPA 13R system.

Public Comment 3:
Proponent: Jeffrey Shapiro, International Code Consultants, representing National Multifamily Housing Council (jeff.shapiro@intlcodeconsultants.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code
903.3.1.2.3 Attics Attic protection shall be provided as follows:

1. Attics that are used or intended for living purposes or storage shall be protected by sprinklers.

2. Where fuel-fired equipment is installed in an unsprinklered attic, at least one quick-response intermediate temperature sprinkler shall be installed above the equipment.

3. Where located in a building of Type III, Type IV or Type V construction designed in accordance with Section 510.2 or Section 510.4 of the International Building Code, attics not required by Item 1 to have sprinklers shall comply with one of the following if the roof assembly is located more than 55 feet (16 764 mm) above the lowest level of required fire department vehicle access:
   a. Provide sprinkler protection in accordance with either Section 903.3.1.1 or 903.3.1.2.
   b. Construct the attic using noncombustible materials.
   c. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the International Building Code.
   d. Fill the attic with noncombustible insulation.

   The height of the roof assembly shall be determined by measuring the distance from the lowest required fire vehicle access road surface adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance. For the purpose of this measurement, required fire vehicle access roads shall include only those roads that are necessary for compliance with Section 503.

4. Group R-4 Condition 2 occupancy attics not required by Item 1 to have sprinklers shall comply with one of the following:
   a. Provide sprinkler protection in accordance with either Section 903.3.1.1 or 903.3.1.2.
   b. Provide a heat detector system throughout the attic that is arranged to activate the building fire alarm system in accordance with Section 907.2.10.
   c. Construct the attic using noncombustible materials.
   d. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the International Building Code.
   e. Fill the attic with noncombustible insulation.

Commenter's Reason: Clarifies that any of the attic protection solutions permitted by NFPA 13 or NFPA 13R are permitted. These standards don't mandate sprinklers for attic protection. Alternatives to sprinklers permitted by NFPA 13 for combustible concealed spaces are permissible for NFPA 13 and NFPA 13R protected buildings, and the NFPA 13R technical committee has approved attic protection criteria to correlate with this requirement.

Proponent: Billie Zidek, APPA, representing APPA requests Disapprove.

Commenter's Reason: The APPA I-Code Work Group and the APPA Standards and Codes Council voted to oppose this proposal because:

- There was scant evidence that this proposal would provide any tangible benefit. A review of fire data showed that in a comparison of fires occurring in NFPA 13 buildings and NFPA 13R buildings there was little difference in terms of total number fires, and extent of property damage, and no difference at all in terms of life safety. The impact of fires in buildings of both system types principally corresponded to the degree of maintenance, repair, or lack thereof and intentional or unintentional disabling of the system.
- On the other hand, the difference to build and maintain an NFPA 13 system is significantly more than an NFPA 13R system. The focus of 13R is to prioritize life safety by focusing on protection of means of egress routes while accepting the
possibility of greater property damage when fires occur in unoccupied spaces such as enclosed attics. This proposal will also have an ongoing maintenance cost impact due to the larger more extensive system.

- The requirement essentially makes sloped roofs for 4 story buildings nonviable as the resulting floor to floor height to stay under the 55 foot limit makes ducted HVAC systems difficult if impossible to install. If the building is on a sloped site and the fire fighting access is on the downhill side, the height requirement could further reduce the attainable height to less than 3 stories. Sloped wood truss roofs are an economical and practical solution in northern climates where snow loads can be an issue. Buildings approaching this height restriction will be more likely built with flat roofs to gain the 5' of allowable height, requiring a beefier structure.

- Roof attic areas requiring full NFPA 13 compliance that heretofore did not must either 1) be built of non-combustible materials (cost concern), 2) completely filled with non-combustible insulation (cost concern and over-use/waste of insulation value), or 3) insulated and heated (construction and ongoing operating cost) or installed as a dry system (construction and maintenance cost and flooding risk). In northern zones, dry sprinkler systems have a poor reputation for allowing water infiltration and condensation, freezing, pipe bursting, and flooding causing significantly more damage than do most fires.
Proposed Change as Submitted

Proponent: Michael O'Brien representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code

Delete and substitute as follows:

904.13 Domestic cooking systems in Group I-2 Condition 1. In Group I-2 Condition 1 occupancies where cooking facilities are installed in accordance with Section 407.2.6 of the International Building Code, the domestic cooking hood provided over the cooktop or range shall be equipped with an automatic fire extinguishing system of a type recognized for protection of domestic cooking equipment. Preengineered automatic extinguishing systems shall be tested in accordance with UL 300A and listed and labeled for the intended application. The system shall be installed in accordance with this code, its listing and the manufacturer's instructions.

Cooktops and ranges installed in the following occupancies shall be protected in accordance with Sections 904.13.1 through 904.13.2:

1. In Group I-2 Condition 1 occupancies where domestic cooking facilities are installed in accordance with Section 407.2.6 of the International Building Code.
2. In Group R-2 college dormitories where domestic cooking facilities are installed in accordance with Section 420.7 of the International Building Code.

904.13.1 Manual system operation and interconnection Protection from fire. Manual actuation and system interconnection for the hood suppression system shall be in accordance with Sections 904.12.1 and 904.12.2, respectively. Cooktops and ranges shall be protected in accordance with Section 904.13.1.1 or 904.13.1.2.

Add new text as follows:

904.13.1.1 Automatic fire-extinguishing system. The domestic cooking hood provided over the cooktop or range shall be equipped with an approved automatic fire-extinguishing system complying with the following:

1. The automatic fire-extinguishing system shall be of a type recognized for protection of domestic cooking equipment. Pre-engineered automatic fire-extinguishing systems shall be listed and labeled in accordance with UL 300A and installed in accordance with the manufacturer's instructions.
2. Manual actuation of the fire-extinguishing system shall be provided in accordance with Section 904.12.1.
3. Interconnection of the fuel and electric power supply shall be in accordance with Section 904.12.2.

904.13.1.2 Ignition prevention. Cooktops and ranges shall include burners that have been tested and listed to prevent ignition of cooking oil with burners turned on to their maximum heat settings and allowed to operate for 30 minutes.

Revise as follows:

904.13.2 Portable fire extinguishers for domestic cooking equipment in Group I-2 Condition 1. No change to text.

Reason: This proposal was developed by a Fire Code Action Committee working group consisting of FCAC, industry and fire service representatives.

Group A code proposals G 105-15 and G 121-15 were approved as submitted. These proposals covered the use of domestic cooking systems in Group I-2, Condition 1 occupancies and Group R-2 college dormitories. The reason statements for both proposals references that changes were needed to IBC/IFC Section 904.13 to provide correlation. This proposal provides this correlation, and makes no substantive changes to the existing Section 904.13 requirements, which are shown below. Section 904.13.1.1 includes some of the automatic fire-extinguishing requirements that were previously located in IBC Section 407.2.6.

904.13.1.2 allows an option for cooktops and ranges with listed ignition resistant burners that do not allow cooking oils to ignite during testing to be provided in lieu of an automatic fire-extinguishing system. Recent work by the Fire Protection Research Foundation confirms that burners meeting these specifications are highly unlikely to ignite cooking materials. See: http://www.nfpa.org/research/fire-protection-research-foundation/reports-and-proceedings/other-research-topics/analytical-modeling-of-pan-and-oil-heating-on-an-electric-coil-cooktop (http://www.nfpa.org/research/fire-protection-research-foundation/reports-and-proceedings/other-research-topics/analytical-modeling-of-pan-and-oil-heating-on-an-electric-coil-cooktop). The UL 858 Standard for Safety for Household Electric Ranges was recently revised to include a new Section 60A Abnormal Operation - Coil Surface Unit Cooking Oil Ignition Test that evaluates the ability of burners to not ignite cooking oil.

Existing 2015 IFC text (for reference only):

904.13 Domestic cooking systems in Group I-2 Condition 1. In Group I-2 Condition 1 occupancies where cooking facilities are installed in accordance with Section 407.2.6 of the International Building Code, the domestic cooking hood provided over the cooktop or range shall be equipped with an automatic fire-extinguishing system of a type recognized for protection of...
domestic cooking equipment. Pre-engineered automatic extinguishing systems shall be tested in accordance with UL 300A and listed and labeled for the intended application. The system shall be installed in accordance with this code, its listing and the manufacturer’s instructions.

**904.13.1 Manual system operation and interconnection.** Manual actuation and system interconnection for the hood suppression system shall be in accordance with Sections 904.12.1 and 904.12.2, respectively.

**904.13.2 Portable fire extinguishers for domestic cooking equipment in Group I-2 Condition 1.** A portable fire extinguisher complying with Section 906 shall be installed within a 30-foot (9144 mm) distance of travel from domestic cooking appliances.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Cost Impact: Will not increase the cost of construction

This proposal provides correlation with new IBC requirements for the domestic cooktops used in non-household occupancies. The option to use cooktops with ignition resistant burners in lieu of an automatic extinguishing system has the potential to actually reduce the cost of construction in these occupancies.

Committee Action: Approved as Submitted

Committee Reason: Approval is based upon the proponent’s published reason.

Assembly Action: None

Individual Consideration Agenda

**Proponent:** Billie Zidek, APPA, representing APPA requests Disapprove.

**Commenter’s Reason:** The APPA I-Codes Work Group and the APPA Standards and Code Council voted to oppose this proposal because;

- Previously, this requirement only applied to I-2, Condition 1 occupancies, (foster care facilities, drug and alcohol detoxification facilities, hospitals, nursing homes, and psychiatric hospitals where the occupants are deemed impaired but capable of acting in response to an emergency). Additionally, this requirement applies only to college dormitories within the R-2 occupancy type. The term “college dormitory” is not defined in the IFC, nor how it would be distinguished from student apartments, married family student housing, or other sorts of living arrangements.
- While cooking is a leading cause of fire department response calls to student housing, statistics show that these calls are typically for burnt food involving some minor smoke often triggering a detection device, and rarely progress into an actual fire. Because so many student housing facilities today have full fire and smoke detection and alarm systems, and sprinkler coverage, the presence which of either the proposal pays no consideration to, plus the fact that this measure would do nothing to protect the plethora of microwaves, hot plates, toaster ovens, and myriad other cooking appliances commonly found makes the practical effect in terms of improved safety minimal.
- The proposal would have a substantial impact on the cost to construct new facilities, and moreover would add a substantial ongoing maintenance cost related to the yearly inspection and upkeep costs for the systems.

F179-16
Proposed Change as Submitted

Proponent: Daniel Nichols, representing New York State Division of Building Standards and Codes (dnichols@dos.state.ny.us)

2015 International Fire Code

Add new text as follows:

905.3.1 Height. Class III standpipe systems shall be installed throughout buildings where the floor level of the highest story is located more than 30 feet (9144 mm) above the lowest level of the fire department vehicle access, or where the floor level of the lowest story is located more than 30 feet (9144 mm) below the highest level of fire department vehicle access.

Exceptions:

1. Class I standpipes are allowed in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Class I standpipes are allowed in Group B and E occupancies.
3. Class I manual standpipes are allowed in open parking garages where the highest floor is located not more than 150 feet (45 720 mm) above the lowest level of fire department vehicle access.
4. Class I manual dry standpipes are allowed in open parking garages that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.
5. Class I standpipes are allowed in basements equipped throughout with an automatic sprinkler system.
6. In determining the lowest level of fire department vehicle access, it shall not be required to consider either of the following:
   6.1. Recessed loading docks for four vehicles or less.
   6.2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.

Reason: The purpose of this code change proposal is to have a discussion on the need for occupant-use hose in Group B and E occupancies. The proposal is written to remove the occupant-use hose from these occupancies by switching from a Class III to a Class I standpipe system in these occupancies.

Occupant-use hose stations are a legacy method of fire protection, going back for decades in model code requirements. In the past 20 years, many fire safety and evacuation plans have all but abandoned the use of occupant-use hose in their training to building occupants; relying on fire extinguisher training (which are required in all new and existing Group B and E occupancies) and the primary focus of evacuation. Also, fire behavior has changed dramatically in the past 30 years due to changes in compartment fire loading. This has created fires that develop faster, create more heat in most situations, and produce greater amount of toxic smoke. Collectively, the ability for occupants to safety and effectively utilize occupant-use hoses without the protection of firefighting gear and respiratory protection has been greatly minimized.

Occupant-use hose is already permitted to not be installed in sprinkler protected buildings that otherwise require standpipes. Even though this seems to be a trade-off by replacing a manual method with an automatic one, the determination of whether occupant-use hose should be based on the occupants ability to suppress a fire rather than the consideration of it as a trade-off. The Division of Building Standards and Codes regularly receives requests from building owners to remove existing occupant-use hose based on modern fire safety plans. All of these requests are supported by local fire officials as they do not see the benefit of the continued maintenance of such systems. Since the 1990's, the Division has supported the removal of occupant hoses in existing buildings either by code interpretation or variance.

The change is specific to Group B and E as these occupancies do not have a “3 story height” trigger for automatic sprinkler systems like other occupancies or address a specific condition like stages. Further, Group F and S occupancies have not been added as they may have a recognized fire brigade that utilize occupant-use hose for first response operations and are trained under OSHA 29 CFR 1910.156.

Cost Impact: Will not increase the cost of construction

The removal of the requirements for occupant-use hose will save on the cost of construction and maintenance of the hose systems.
Committee Action: Approved as Submitted

Committee Reason: The approval is based on the correlation with code change proposal F150-16 and the position that untrained occupants should not have or use Class III standpipes.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Daniel E Nichols, representing Self requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

905.3.1 Height. Class III standpipe systems shall be installed throughout buildings where the floor level of the highest story is located more than 30 feet (9144 mm) above the lowest level of the fire department vehicle access, or where the floor level of the lowest story is located more than 30 feet (9144 mm) below the highest level of fire department vehicle access.

Exceptions:

1. Class I standpipes are allowed in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Class I standpipes are allowed in Group B and E occupancies.
3. Class I manual standpipes are allowed in open parking garages where the highest floor is located not more than 150 feet (45 720 mm) above the lowest level of fire department vehicle access.
4. Class I manual dry standpipes are allowed in open parking garages that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.
5. Class I standpipes are allowed in basements equipped throughout with an automatic sprinkler system.
6. Class I standpipes are allowed in buildings where occupant-use hose lines will not be utilized by trained personnel or the fire department.
7. In determining the lowest level of fire department vehicle access, it shall not be required to consider either of the following:
   7.1. Recessed loading docks for four vehicles or less.
   7.2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.

Commenter's Reason: This public comment is a correlation of F149 and F185. Both proposals had a common theme that occupant-use hose lines are not effective in occupancies where trained personnel is not present; regardless of other forms of fire protection.

F149 was approved as submitted, allowing the removal of occupant-use hose lines in all buildings, regardless of the new construction requirements of the IBC/IFC. The two items retained was whether the building had trained personnel and that the standpipes are compatible with fire department hose threads.

This public comment carries over the language from 901.8.2 into a new exception, stating that only a Class I standpipe system (FD use only) is required when the building occupants will not be trained to use the occupant-use hose lines.

Since the removal of the requirements to install occupant-use hose lines in all Group B and E was approved as submitted and many other occupancies are already covered because of the sprinkler threshold (see original reason statement), the only place that a Class III standpipe is required is unsprinklered Group F-2, S-2, and U. This will allow the building owner and design team to determine the need for occupant-use hose lines in these 3 occupancies that are the lowest fire hazards of all of the occupancies, as well as align with the allowances already found in 901.8.2 and the position of the committee at the CAH.
Proposed Change as Submitted

**Proponent**: Bob Morgan, PE, representing Fort Worth Fire Department

2015 International Fire Code

907.2.1 Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where the occupant load due to the assembly occupancy is 300 or more, or where the Group A occupant load is more than 100 persons above or below the lowest level of exit discharge. Group A occupancies not separated from one another in accordance with Section 707.3.10 of the **International Building Code** shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

**Exception**: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

**Reason**: This change would serve to increase the fire alarm requirement where the A occupancy is located on a level other than that of exit discharge to be at least as strenuous as that of a B occupancy, which has the same 100 occupant load criteria for such.

**Cost Impact**: Will increase the cost of construction

This will increase the cost of construction where A occupancies meet the criteria established by the change.

Public Hearing Results

**Committee Action**: Approved as Submitted

**Committee Reason**: Approval is based upon the proponent's published reason and that Group A occupants are less familiar with surroundings.

**Assembly Action**: None

**Individual Consideration Agenda**

**Proponent**: Gregory Keith, representing The Boeing Company (grkeith@mac.com) requests Disapprove.

**Commenter's Reason**: The technical rationale for this proposal was that the fire alarm requirements for Group A occupancies should be at least as strenuous as Group B occupancies. The appropriate level of fire and life safety for a given occupancy is achieved through the use of various fire protection systems. The proposal would require Group A occupancies to have a manual fire alarm system where the Group A occupant load is more than 100 persons above or below the lowest level of exit discharge. Section 903.2.1 requires that an automatic sprinkler system be provided for Group A-1, A-2, A-3 and A-4 occupancies where such fire area is located on a floor other than a level of exit discharge serving such occupancies. Fire suppression is addressed at floors other than the level of exit discharge regardless of the Group A occupant load. There are no Group B fire area automatic sprinkler system thresholds stated in Section 903.2. Based on the possibility that a Group B occupancy may not be provided with fire suppression means, occupant notification as a fire protection feature becomes important.

Currently, Section 907.2.1 requires a manual fire alarm system where a Group A occupant load is 300 or more. This is an appropriate threshold given the required automatic sprinkler system protection. Reducing the alarm system occupant load threshold to 100 serves no practical purpose. To understand this, it is helpful to assign some scale to the discussion.

Assuming a typical assembly occupant load factor of 15 square feet per occupant, the minimum area under consideration would be 1,500 square feet. The dimension of the space would be approximately 39 foot square. Obviously, any occupant in an area that small would have virtually immediate sensory awareness of a fire event. A formal alarm system is unnecessary, especially in an area provided with an automatic sprinkler system.

The present 300 occupant load alarm threshold applies to spaces at least 4,500 square feet in area. This equates to an approximate 67 foot square area. It could be argued that sensory awareness would also occur in an area that small. However, to allow for irregularly shaped spaces and to provide for a high degree of safety, that conservative threshold is appropriate.
Additionally, there were no loss history data submitted to substantiate the proposed increase in the level of protection. The proposal appears to be an inappropriate extension of logic based on Group B occupancy provisions. The proponent acknowledged that the proposal would increase the cost of construction. There is no fire and life safety value associated with such cost increases.

In summary, different occupancies have different risk factors and different fire protection system requirements. One size does not fit all. Current Group A fire alarm system requirements are appropriate and have proven to be adequate over time. F194-16 should be disapproved by the ICC membership.
F196-16
907.2.10 (IBC [F] 907.2.10), 907.2.10.1 (IBC [F] 907.2.10.1), 907.2.10.2 (IBC [F] 907.2.10.2), 1103.1, 1103.7.7; IBC [F] 420.6

Proposed Change as Submitted

Proponent: Carl Baldassarra, P.E., FSFPE, representing the Code Technology Committee (CTC@iccsafe.org)

2015 International Fire Code

Delete without substitution:

907.2.10 Group R-4. Fire alarm systems and smoke alarms shall be installed in Group R-4 occupancies as required in Sections 907.2.10.1 through 907.2.10.3.

907.2.10.1 Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-4 occupancies.

- Exceptions:
  1. A manual fire alarm system is not required in buildings not more than two stories in height where all individual sleeping units and contiguous attic and crawl spaces to those units are separated from each other and public or common areas by not less than 1-hour fire partitions and each individual sleeping unit has an exit directly to a public way; egress court or yard.
  2. Manual fire alarm boxes are not required throughout the building where all of the following conditions are met:
     2.1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
     2.2. The notification appliances will activate upon sprinkler water flow.
     2.3. Not fewer than one manual fire alarm box is installed at an approved location.
     2.4. Manual fire alarm boxes in resident or patient sleeping areas shall not be required at exits where located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that the distances of travel required in Section 907.4.2.1 are not exceeded.

907.2.10.2 Automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in corridors, waiting areas open to corridors and habitable spaces other than sleeping units and kitchens.

- Exceptions:
  1. Smoke detection in habitable spaces is not required where the facility is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
  2. An automatic smoke detection system is not required in buildings that do not have interior corridors serving sleeping units where each sleeping unit has a means of egress door opening directly to an exit or to an exterior exit access that leads directly to an exit.

TABLE 1103.1
OCCUPANCY AND USE REQUIREMENTS

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a. Existing buildings shall comply with the sections identified as "Required" (R) based on occupancy classification or use, or both, whichever is applicable.
b. Only applies to Group I-2 Condition 2 as established by the adopting ordinance.
c. Only applies to Group A-2 occupancies.

R = The building is required to comply.

1103.7.7 - Group R-4: A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group 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 not less than 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.

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**2015 International Building Code**

Revise as follows:

[F] 420.6 Fire alarm systems and smoke alarms. Fire alarm systems and smoke alarms shall be provided in Group I-1, R-1, and R-2 and R-4 occupancies in accordance with Sections 907.2.6, 907.2.8, and 907.2.9 and 907.2.10, respectively. Single- or multiple-station smoke alarms shall be provided in Groups I-1, R-2, R-3 and R-4 in accordance with Section 907.2.11.

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**2015 International Existing Building Code**

Delete without substitution:

804.4.1.7 - Group R-4: A fire alarm system shall be installed in work areas of Group R-4 residential care/assisted living facilities as required by the International Fire Code for existing Group R-4 occupancies.

**Reason:** The requirements for a manual fire alarm system and an automatic smoke detection system in a facility with 16 or fewer residents is unwarranted. Such a system would not be required in an apartment building until there were at least 16 apartments – which is potentially many more people. Group R-4 is required to have single- and multiple- smoke alarms. Some of the language ‘nurse’s control stations’ and ‘constantly attended staff locations’ is not applicable to group homes of this small size. This is not an attempt to remove the requirement for single- and multiple- station smoke alarms in Section 907.2.11.2. For correlation, the mandatory retrofit requirement for this system should also be deleted from the IFC Chapter 11 Construction Requirements for Existing Buildings and the reference to the same in the IEBC.

This proposal is submitted by the ICC Code Technology Committee (CTC). The ICC Board has decided to sunset the CTC. The sunset plan includes re-assigning many of the CTC Areas of Study to the applicable Code Action Committee (CAC). The two remaining CTC Areas of Study are Care Facilities and Elevator Lobbies/WTC Elevator issues. This proposal falls under the Care...
Facilities Area of Study. In 2014 and 2015 ICC CTC Committee has held 4 open meetings and numerous Work Group meetings and conference calls for the current code development cycle which included members of the committees as well as any interested party to discuss and debate the proposed changes. Information on the CTC, including: the sunset plan; meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the CTC website CTC (http://www.iccsafe.org/cs/CTC/Pages/default.aspx).

**Cost Impact:** Will not increase the cost of construction
This is a logical reduction in requirements.

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**Public Hearing Results**

Committee Action: Disapproved
Committee Reason: Disapproval was based upon the proponent's request to improve the proposal with a public comment.
Assembly Action: None

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**Individual Consideration Agenda**

**Public Comment 1:**

Proponent: Carl Baldassarra, P.E., FSFPE, representing Code Technologies Committee (CTC@iccsafe.org) requests Approve as Modified by this Public Comment.

Further Modify as follows:

2015 International Fire Code

907.2.10.2 - **Automatic smoke detection system:**
An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in corridors, waiting areas open to corridors and habitable spaces other than sleeping units and kitchens.

- **Exceptions:**
  1. Smoke detection in habitable spaces is not required where the facility is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
  2. An automatic smoke detection system is not required in buildings that do not have interior corridors serving sleeping units and where each sleeping unit has a means of egress door opening directly to an exit or to an exterior exit access that leads directly to an exit.

907.2.10.3 - **Smoke alarms:**
Single and multiple station smoke alarms shall be installed in accordance with Section 907.2.11.

**Commenter's Reason:** The committee disapproved this proposal based on a request for CTC to further review the proposal. The intent remains the same - to allow for group homes with residents capable of self preservation to have an appropriate level of safety. To ask for a manual fire alarm system and an automatic smoke detection system for a facility with 16 or fewer residents is not warranted. These systems are required in apartment buildings with 16 or more apartments. Not only does that apartment building have significantly more residents, it consists of separate units. A Group R-4 facility is where the residents are effectively working together similar to a single family home. Section 907.2.10.3 is not needed because it is only a pointer to the requirement for single- and multiple-station smoke detectors required in Section 907.2.11.2. Therefore, this proposal asks for deletion of all of Section 907.2.10 through 907.2.10.3. The changes to the IFC Table 1103.1 and Section 1103.7.7, IBC Section 420.6 and IEBC 804.4.1.7 are strictly correlative.
F197-16
907.2.13.3 (New) (IBC [F] 907.2.13.3 (New))

**Proposed Change as Submitted**

**PropONENT**: Stephen DiGiovanni, Clark County Department of Building and Fire Prevention, representing Southern Nevada Chapter of ICC (sdigiovanni@clarkcounty.gov)

2015 International Fire Code

Add new text as follows:

907.2.13.3 **Multi-channel voice evacuation**  Voice evacuation systems for high-rise buildings shall be multi-channel systems.

**Reason**: It's common policy within jurisdictions for high-rise buildings to evacuate the floor of alarm, the floor above and the floor or floors below the alarm floor. A fire alarm system that has multiple channels allows one area of the building to receive an evacuation message, while other areas of the building can be given other instructions.

**Cost Impact**: Will increase the cost of construction

For those fire alarm notification systems that previously would have been allowed to be installed in high-rise buildings as a single-channel system, this code proposal will increase the cost of the fire alarm notification system.

**Public Hearing Results**

Committee Action: Disapproved

Committee Reason: The committee stated that a single channel system is sufficient and the need for a multi-channel system was not justified.

Assembly Action: None

**Individual Consideration Agenda**

Public Comment 1:

PropONENT: Stephen DiGiovanni, representing Southern Nevada Chapter of ICC (sdigiovanni@clarkcounty.gov); James Gerren, representing Southern Nevada Chapter of ICC (JCG@ClarkCountyNV.gov) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

907.2.13.3 **Multi-channel voice evacuation**, Voice

In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, voice evacuation systems for high-rise buildings shall be multi-channel systems.

**Commenter’s Reason**: During the testimony on F197-16, the committee stated that they felt a single channel system is sufficient and that a multi-channel system is an unwarranted cost increase. Single-channel systems are limited in that the emergency responders can only deliver one message at a time. A multi-channel system allows the emergency responders to deliver different live messages to various areas of the building at one time, which can lead to more detailed and more efficient emergency communications to the occupants. For example, if a fire occurs on the sixth floor of a high-rise building, a multi-channel system can be used by the emergency responders to direct the occupants of the fifth, sixth, and seventh floors to immediately egress via the nearest exit stairway, while at the same time separately informing the occupants of the eighth and higher levels of the situation and directing them to standby. This type of ability can help the emergency responders control the crowding within the exit stairways. Additionally, the benefits of the multi-channel system are not limited to fire evacuations only, as these systems can also be used effectively in active-shooter and other non-fire emergencies.

The proposed modification would make the requirement for multi-channel voice evacuation systems applicable to high-rise buildings only when the buildings have an occupied floor more than 120 feet above the lowest level of fire department vehicle access. The added language is consistent with (identical to) the language used in the requirement for fire service...
access elevators in high-rise buildings found in IBC Section 403.6.1. This change to the proposal addresses hearing testimony, which expressed a concern that multi-channel systems may be useful for taller high-rise buildings but an unwarranted cost impact for smaller high-rise buildings (i.e., high-rise buildings that are only 8- to 12-stories in height).

Regarding the cost impact, multi-channel systems require the installation of a multi-channel audio controller, so there is a slight increase to the upfront cost of a multi-channel system. However, fire alarm risers for new systems today are digital and therefore do not require a dedicated second riser for a multi-channel system. The rest of the system infrastructure and equipment, including speakers and amplifiers, is required and provided whether or not the emergency voice/alarm communication system is single-channel or multi-channel. Therefore, the overall cost impact to configure an emergency voice/alarm communication system for multi-channel audio compared to a single-channel system is very minor.

F197-16
Proposed Change as Submitted

Proponent: John Williams, CBO, representing Adhoc Healthcare Committee (AHC@iccsafe.org)

2015 International Fire Code

Revise as follows:

907.2.2 Group B. A manual fire alarm system shall be installed in Group B occupancies where one of the following conditions exists:

1. The combined Group B occupant load of all floors is 500 or more.
2. The Group B occupant load is more than 100 persons above or below the lowest level of exit discharge.
3. The fire area contains an ambulatory care facility.

   Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

Add new text as follows:

907.2.2.1 Ambulatory care facilities. Fire areas containing ambulatory care facilities shall be provided with a manual fire alarm system. Fire areas containing ambulatory care facilities shall be provided with an electronically supervised automatic smoke detection system installed within the ambulatory care facility and in public use areas outside of tenant spaces, including public corridors and elevator lobbies.

   Exception: Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 provided the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

K102.4 Manual fire alarm system. Fire areas containing an ambulatory care facility shall have a manual fire alarm system installed throughout the fire area.

Reason: The AHC is proposing a revision to address some of the oversights in the I-Codes of long-standing and operational requirements for hospitals and healthcare facilities that has not been specifically addressed. The requirements being proposed in this code change have been long-standing provisions of the construction and operational requirements for healthcare facilities.

In the last code cycle, the requirement for a manual fire alarm system was correlated with the IBC for consistency with CMS requirements for ambulatory healthcare facilities and was passed. Although Ambulatory Healthcare Facilities may be classified as a B-Business Occupancy, the intent was not to allow an exception for an Ambulatory Healthcare Facility's provision of a manual fire alarm system when the occupant load is under 100 persons. Since there have been questions presented to staff and the ICC Adhoc Healthcare Committee, we are proposing this reorganization to IFC/IBC Section 907.2.2 to provide additional clarification for the specific requirements for Ambulatory Healthcare Facilities. IBC Section 907.2.2.1 is the new subsection with the same requirements provided for under the previous code; it is being proposed to clearly identify where manual fire alarms are required and when any exception to this requirement would be applicable to the Ambulatory Healthcare Facility.

This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2014 and 2015 the ICC Ad Hoc Committee has held 4 open meetings and numerous Work Group meetings and conference calls for the current code development cycle which included members of the committees as well as any interested party to discuss and debate the proposed changes. Information on the AHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the AHC effort can be downloaded from the AHC website at: AHC (http://www.iccsafe.org/cs/AHC/Pages/default.aspx).

Cost Impact: Will not increase the cost of construction

This is already a requirement in the code and the intent was never to have the ambulatory healthcare facility utilize the exception for an occupant load of less than one hundred persons.
Public Hearing Results

Committee Action: Disapproved
Committee Reason: The committee stated that they did not agree with the location and language of the proposed revision to the exception.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: John Williams, CBO, representing Adhoc Healthcare Committee (AHC@iccsafe.org) requests Approve as Modified by this Public Comment.

Further Modify as Follows:

2015 International Fire Code

907.2.2.1 Ambulatory care facilities. Fire areas containing ambulatory care facilities shall be provided with a manual fire alarm system. Fire areas containing ambulatory care facilities shall be provided with an electronically supervised automatic smoke detection system installed within the ambulatory care facility and in public use areas outside of tenant spaces, including public corridors and elevator lobbies.

Exception: Buildings. An electronically supervised automatic smoke detection system is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 provided the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

Commenter’s Reason: The IFC development committee stated that they did not agree with the location and language of the proposed revision to the exception. There is no revision to the exception in Section 907.2.2. CDPAccess simply showed the existing exception both struck and underlined. The purpose of this proposal is as stated in the original reason. Additional wording was added to the exception to limit the exception to the removal of the smoke detection system.
Proposed Change as Submitted

Proponent: William Hall, Portland Cement Association (jhall@cement.org)

2015 International Fire Code

Revise as follows:

907.2.8.1 Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-1 occupancies.

Exceptions:
1. A manual fire alarm system is not required in buildings not more than two stories in height where all individual sleeping units and contiguous attic and crawl spaces to those units are separated from each other and public or common areas by not less than 1-hour fire partitions and each individual sleeping unit has an exit directly to a public way, egress court or yard.
2. Manual fire alarm boxes are not required throughout the building where all of the following conditions are met:
   2.1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
   2.2. The notification appliances will activate upon sprinkler water flow.
   2.3. Not fewer than one manual fire alarm box is installed at an approved location.

907.2.9.1 Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-2 occupancies where any of the following conditions apply:
1. Any dwelling unit or sleeping unit is located three or more stories above the lowest level of exit discharge.
2. Any dwelling unit or sleeping unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit or sleeping unit.
3. The building contains more than 16 dwelling units or sleeping units.

Exceptions:
1. A fire alarm system is not required in buildings not more than two stories in height where all dwelling units or sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by not less than 1-hour fire partitions and each dwelling unit or sleeping unit has an exit directly to a public way, egress court or yard.
2. Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and the occupant notification appliances will automatically activate throughout the notification zones upon a sprinkler water flow.
3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with Section 1027.6, Exception 3.

Reason: Currently manual pull stations are not required at exits in R-1 and R-2 occupancies when an NFPA 13R fire sprinkler system is installed. The exception for 907.2.8.1 permits one manual pull station at an approved location, which many times is located in the main riser room away from public access. While this exception may be appropriate for NFPA 13 systems where all combustible concealed areas are either sprinkled or dealt with by other approved means, NFPA 13R systems do have NOT the benefit of providing automatic alarm annunciation via the water flow alarm as well as offsite communication (or other) to emergency responders. Fire located in the attic or other combustible concealed spaces will go undetected until observed by someone or possibly a smoke detector on the top occupied floor after the fire has burned through and smoke fills the areas. An observer may very well spot the fire and call it in, however that action will not trip the alarm system alerting the occupants. Manual pull stations are an effective way to trip the fire alarm and provide the earliest warning possible to other occupants. How else would the alarm be tripped if fire is in the attic area, unless the person spotting the fire knows where the one and only pull station is? This proposal removes NFPA 13R from the exception and will require manual pull stations at exits in R-1 and R-2 occupancies using NFPA 13R systems.

Cost Impact: Will increase the cost of construction
This proposal will increase the cost of construction negligibly by requiring manual pull stations at the exits for an already required alarm system.
Committee Action: Disapproved

Committee Reason: The committee stated that the existing exception for NFPA 13R systems should remain in the section due to the occurrences and consequences of false alarms.

Assembly Action: None

Individual Consideration Agenda

Proponent: William Hall, representing Portland Cement Association (jhall@cement.org) requests Approve as Submitted.

Commenter's Reason: Video and tamper resistant boxes will address the false alarm concerns by the committee. As stated in my testimony, in buildings where protected by 13R systems, many areas exist where sprinkler protection is not provided, therefore the water valve will not trip until fire has gotten fully developed into the protected areas. Trade offs for pull stations when the building is protected by a 13R are not warranted.
Committee Action: Approved as Submitted

Proponent: Ali Fattah, City of San Diego Development Services Department (afattah@sandiego.gov)

2015 International Fire Code

Proposed Change as Submitted

Revise as follows:

907.2.9.1 Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-2 occupancies where any of the following conditions apply:

1. Any dwelling unit or sleeping unit is located three or more stories above the lowest level of exit discharge.
2. Any dwelling unit or sleeping unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit or sleeping unit.
3. The building contains more than 16 dwelling units or sleeping units.

Exceptions:

1. A fire alarm system is not required in buildings not more than two stories in height where all dwelling units or sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by not less than 1-hour fire partitions and each dwelling unit or sleeping unit has an exit directly to a public way, egress court or yard.
2. Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and the occupant notification appliances will automatically activate throughout the notification zones upon a sprinkler water flow.
3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with Section 1027.6, Exception 3.

Reason: This code change is necessary due to the unintended consequences of an editorial code change that was approved and published since the 2009 IBC/IFC as a result of code change E5-06/07. The code change revised the definition “EXIT DISCHARGE, LEVEL OF” for consistency with NFPA 101 the Life Safety Code. The reason statement in the code change or a subsequent code change in the following cycle E8-07/08 clearly state the proponent's intent to not change code requirements. The change in the definition has had ripple effects affecting triggers for fire alarm in Group R-2, triggers for accessible means of egress etc. Many Code Officials still enforce the requirements based on the prior definition so there has been no change in code application.

Prior to 2009, the level of exit discharge was "The horizontal plane located at the point at which an exit terminates and an exit discharge begins.” Based on that definition, the ground floor was the first story above the level of exit discharge. Therefore, the requirement for a manual fire alarm system was triggered at by a three story building.

Since the 2009 IBC/IFC, the level of exit discharge is defined as "The story at the point at which an exit terminates and an exit discharge begins.” This means that the ground floor is the level of exit discharge and the floor above would be the story above the level of exit discharge. Based on that definition, the three stories above the level of exit discharge would be the 4th story.

This proposal will clarify that when the R-2 consists of the level of exit discharge and 2 stories above, then the manual fire alarm system is required.

Cost Impact: Will not increase the cost of construction

Most building and fire officials have triggered fire alarms based on the old definition when enforcing the 2009 IBC/IFC to the present.
Assembly Action: None

Individual Consideration Agenda

Proponent: Jeffrey Shapiro, International Code Consultants, representing National Multifamily Housing Council (jeff.shapiro@intlcodeconsultants.com) requests Disapprove.

Commenter's Reason: Upon initial review, we had believed that the proponent's substantiation was correct and that this change was correcting an oversight. Further review of the matter revealed that this was not correct, and the proponent's substantiation, which we had supported at the committee hearing, is inaccurate. Further details will be provided at the public comment hearing.

F201-16
Proposed Change as Submitted

Proponent: Daniel Nichols, representing State of New York (dnichols@dos.state.ny.us)

2015 International Fire Code

Add new text as follows:

907.5.2.1 Audible alarms. Audible alarm notification appliances shall be provided and emit a distinctive sound that is not to be used for any purpose other than that of a fire alarm.

Exceptions:

1. Audible alarm notification appliances are not required in critical care areas of Group I-2 Condition 2 occupancies that are in compliance with Section 907.2.6, Exception 2.
2. A visible alarm notification appliance installed in a nurses’ control station or other continuously attended staff location in a Group I-2 Condition 2 suite shall be an acceptable alternative to the installation of audible alarm notification appliances throughout the suite in Group I-2 Condition 2 occupancies that are in compliance with Section 907.2.6, Exception 2.
3. Where provided, audible notification appliances located in each occupant evacuation elevator lobby in accordance with Section 3008.9.1 of the International Building Code shall be connected to a separate notification zone for manual paging only.
4. In areas of buildings serving persons with developmental disabilities, occupant notification systems are not required to be activated where private mode signaling installed in accordance with NFPA 72 is approved by the fire code official and staff evacuation responsibilities are included in the fire safety and evacuation plan required by Section 404.

907.5.2.3 Visible alarms. Visible alarm notification appliances shall be provided in accordance with Sections 907.5.2.3.1 through 907.5.2.3.3.

Exceptions:

1. Visible alarm notification appliances are not required in alterations, except where an existing fire alarm system is upgraded or replaced, or a new fire alarm system is installed.
2. Visible alarm notification appliances shall not be required in exits as defined in Chapter 2.
3. Visible alarm notification appliances shall not be required in elevator cars.
4. Visual alarm notification appliances are not required in critical care areas of Group I-2 Condition 2 occupancies that are in compliance with Section 907.2.6, Exception 2.
5. In areas of buildings serving persons with developmental disabilities, occupant notification systems are not required to be activated where private mode signaling installed in accordance with NFPA 72 is approved by the fire code official and staff evacuation responsibilities are included in the fire safety and evacuation plan required by Section 404.

Reason: Persons with developmental disabilities addresses a variety of conditions including cerebral palsy, autism, and other neurological impairments that cause mental and/or physical conditions. The elevated sound pressure of audible notification devices and the strobing visual notification devices can cause sensory overload to persons with developmental disabilities; causing such persons to become incapacitated or to be diminished in their ability to rationally respond to the activation. Many persons with developmental disabilities are able to self-evacuate or make decisions regarding their safety as long as their impairments are not adversely effected. The purpose of this code change proposal is to permit private mode signaling similar to that permitted in the healthcare requirements to address this need. NFPA 72 18.4.4 permits the audible requirements to be reduced or eliminated when approved by the AHJ and visible notification is provided by Section 18.5. Section 18.5 also permits a private mode for visual notification that is based on an evaluation that is approved by the AHJ. Collectively, this proposal would require that any use of private mode signaling for either audible or visual notification is approved by the AHJ.

The proposal also adds the requirement for incorporation of the specific population served by the private mode signaling to be incorporated into the fire safety and evacuation plans. The scope of the proposal is not to address one specific occupancy since persons with developmental disabilities reside in a variety of residential and institutional settings, as well as educational and work environments.

In our experience, a fire alarm notification system that does not take into account the needs of persons with developmental disabilities has a higher probability of further complicating the evacuation of occupants. The startling of patients can cause either physical incapacitation, hiding behavior, or irrational actions that make the increases the burden on staff in charge of building evacuation. Since the fire safety and evacuation plan is part of this proposal, staffing levels and responsibilities should be part of such plan.
**Public Hearing Results**

**Committee Action:** Disapproved

**Committee Reason:** The committee stated that they did not agree with the addition of the undefined term of "developmental disabilities" and noted that the subject is too broad.

**Assembly Action:** None

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**Individual Consideration Agenda**

**Public Comment 1:**

**Proponent:** Jeff O'Neill, representing Self requests Approve as Modified by this Public Comment.

**Modify as Follows:**

2015 International Fire Code

907.5.2.1 Audible alarms. Audible alarm notification appliances shall be provided and emit a distinctive sound that is not to be used for any purpose other than that of a fire alarm.

**Exceptions:**

1. Audible alarm notification appliances are not required in critical care areas of Group I-2 Condition 2 occupancies that are in compliance with Section 907.2.6, Exception 2.

2. A visible alarm notification appliance installed in a nurses' control station or other continuously attended staff location in a Group I-2 Condition 2 suite shall be an acceptable alternative to the installation of audible alarm notification appliances throughout the suite in Group I-2 Condition 2 occupancies that are in compliance with Section 907.2.6, Exception 2.

3. Where provided, audible notification appliances located in each occupant evacuation elevator lobby in accordance with Section 3008.9.1 of the *International Building Code* shall be connected to a separate notification zone for manual paging only.

4. In areas of Group B, E, I and R-4 buildings serving persons with developmental disabilities, occupant notification systems are not required to be activated where private mode signaling installed in accordance with NFPA 72 is approved by the fire code official and staff evacuation responsibilities are included in the fire safety and evacuation plan required by Section 404.

**Commenter's Reason:** This public comment responds to the feedback from the committee by more specifically targeting areas where those with developmental disabilities would likely congregate in groups. Group B is likely a specific area of a business where someone with developmental disabilities would work in a closed setting. Group E covers the classroom setting in any school, where it is common to have dedicated classrooms to serve students with developmental disabilities. Group I covers where care is to be delivered in a more acute setting, where R-4 covers group homes.

Not requiring audible alarms (and therefore allowing a private-mode alarm) is a key allowance because audible alarms may in fact hinder evacuation of this population, effecting the other occupants of the building. Someone with developmental disabilities may be overwhelmed by the stimulus of the audible alarm, and actually be unable to move and/or resist the evacuation. Private mode would allow an individual caregiver or teacher, who know them best, to more effectively move this population to safety.
Committee Action: Approved as Modified

Assembly Action: None

Proposed Change as Submitted

Proponent: Thomas Hammerberg, Automatic Fire Alarm Association, representing Automatic Fire Alarm Association (tomhammerberg@afaa.org)

2015 International Fire Code

Revise as follows:

907.5.2.3.3 Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, all floors that contain dwelling units and sleeping units shall be provided with the future capability in fire alarm system power supply and circuits on each floor riser to support visible alarm notification appliances in accordance with Chapter 10 of 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.

Reason: This proposed change will save construction costs and provide clear direction for designers, owners and installers in R-2 buildings. The code intent has not changed. There needs to be a capability to support visible fire alarm notification appliances in R-2 buildings when needed as the building evolves. What has been happening with the current language for “capability” is that some designers/code authorities took this to mean that you need to install conduit and wiring throughout a new building (into each dwelling unit) for possible future use. The identified intention was that the fire alarm system head end (power supplies, circuits, etc.) have a “capability” to support an additional visual appliances, not to have conduit and circuits run into each dwelling unit for some possible future use.

With this code change, the building will have the capability on EACH FLOOR to support additional visible appliances and will clarify the design.

Cost Impact: Will not increase the cost of construction

NONE. It will have an impact on saving construction costs as described above.

Committee Reason: Approval is based upon the proponent's published reason. The modification was approved because it allows for new technology.

Public Hearing Results

Modification:

907.5.2.3.3 Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, all floors that contain dwelling units and sleeping units shall be provided with the future capability in fire alarm system power supply and circuits on each floor riser to support visible alarm notification appliances in accordance with Chapter 10 of 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.

Committee Reason: Approval is based upon the proponent's published reason. The modification was approved because it allows for new technology.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: James Carver, El Segundo Fire Department, representing El Segundo Fire Department (JCarver@elsegundo.org) requests Approve as Modified by this Public Comment.

Further Modify as Follows:

2015 International Fire Code
907.5.2.3.3 Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, all floors that contain dwelling units and sleeping units shall be provided with the future capability to support visible alarm notification appliances in accordance with Chapter 10 of ICC A117.1.

Such capability shall be permitted to include utilize wired or wireless equipment. For wired equipment, 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 capability shall be permitted to required locations for visible appliances: be accomplished by providing:

1. The potential for future interconnection of the building fire alarm system with the unit smoke alarms,
2. Additional relays to connect to existing smoke alarms and/or smoke detectors,
3. Installation of wiring or raceways from the building future fire alarm equipment locations to the dwelling and sleeping units,
4. Replacement of audible appliances with audible/visible appliances.

Commenter's Reason: I think the Committee was correct in allowing new technology in the code requirement, however, the options for future capacity in wired systems needs to be clearly identified. To utilize Subsection 2, relays are required to connect 110 volt smoke alarms to building FACU to activate building visible notification appliance in the units. To clarify Subsection 3 for future expansion of the visible notification appliances, we believe that by only running a raceway or wiring down the corridor will meet the requirement for future capacity. It is assumed there already is a power supply per floor for corridor visible notification. As power demands increase, additional power supplies can be added per floor. There would not be an increase in cost.

Public Comment 2:

Proponent: Jeffrey Shapiro, International Code Consultants, representing National Multifamily Housing Council (jeff.shapiro@intlcodeconsultants.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

907.5.2.3.3 Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, each story that contains dwelling units and sleeping units shall be provided with the future capability to support visible alarm notification appliances in accordance with Chapter 11 of ICC A117.1. Such capability shall be permitted to utilize wired or wireless equipment. The future capability shall be permitted to include:

1. The potential for future interconnection of the building fire alarm system with the unit smoke alarms,
2. Replacement of audible appliances with combination audible/visible appliances, or
3. Future extension of the existing wiring from the unit smoke alarm locations to required locations for visible appliances.

Commenter's Reason: 1. Changes the text to use the IBC defined term "story" rather than "floor."
2. Correlates with the change to A117.1-2015, which renumbered Chapter 10 to Chapter 11.
3. More specifically recognizes wireless equipment as the new technology mentioned in the committee reason statement for Approval as Modified.
4. Reformats the three existing options for providing future expansion capability as a list for clarity.
F215-16
IFC: 907.10 (New).

**Proposed Change as Submitted**

Proponent: Michael O'Brian representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code

Add new text as follows:

**907.10 Smoke alarm maintenance.** Smoke alarms shall be tested and maintained in accordance with the manufacturer's instructions. Smoke alarms shall be replaced when they fail to respond to operability tests, or when they exceed 10 years from the date of manufacture, unless otherwise provided by the manufacturer's published instructions.

- **Reason:** Section 907.8 covers the inspection, testing and maintenance of fire alarm and fire detection systems, but does not include specific requirements for testing and maintaining smoke alarms since they are not a fire alarm or fire detection system. This proposal includes requirements for testing, maintaining and replacing inoperative smoke alarms that are consistent with NFPA 72 requirements, including the following:
  - NFPA 72, Section 14.4.5.4 Smoke alarms shall be replaced when they fail to respond to operability tests.
  - NFPA 72, Section 14.4.5.4.1 Smoke alarms shall not remain in service longer than 10 years from the date of manufacture, unless otherwise provided by the manufacturer's published instructions.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Cost Impact: Will not increase the cost of construction

The proposal does not introduce new construction requirements, but there will be expenses associated with replacing inoperative or obsolete smoke alarms.

F215-16 : 907.10
(NEW)-
O'BRIAN10726

**Public Hearing Results**

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason as well as being in agreement with the IPMC.

Assembly Action: **None**

Individual Consideration Agenda

Proponent: Thomas Daly, The Hospitality Security Consulting Group, LLC, representing American Hotel & Lodging Association (tom.daly@thehscg.com) requests Disapprove.

Commenter's Reason: The Fire Code Committee's action ignores the history of this issue which was limited to one and two-family dwellings, has no fire record to support the imposition of a $25 million annual burden on the hotel industry alone, plus additional economic impact on other affected commercial occupancies using smoke alarms including health care and educational dormitories. These commercial occupancies have significant code requirements for the routine (typically monthly) testing, inspection and maintenance of smoke alarms, enforcement of such requirements by fire code officials and a liability if they fail to do so. One and two family dwellings are not subject to the same requirements and the history of this
replacement requirement at 10 years has been on for one and two family dwellings until the 2014 edition of NFPA 72. The ICC should not make the same error as the NFPA and should insist on contemporary evidence of the need for such a costly proposal. The proposed code change should be disapproved.

Thomas G. Daly MSc. CSP
Principal
The Hospitality Security Consulting Group, LLC
Representing the American Hotel & Lodging Association
F219-16
IFC: 909.22 (New), 909.22.1 (New), 909.22.1.1 (New), 909.22.1.2 (New), 909.22.1.3 (New).

Proposed Change as Submitted

Proponent: Bob Morgan, PE, representing Fort Worth Fire Department

2015 International Fire Code

Add new text as follows:

909.22 Stairway or ramp pressurization Where the building is provided with stairway or ramp pressurization for compliance with the International Building Code requirements for a smokeproof enclosure, interior exit stairways or ramps shall be pressurized to not less than 0.10 inches of water (25 Pa) and not more than 0.35 inches of water (87 Pa) in the shaft relative to the building measured with all interior exit stairway and ramp doors closed under maximum anticipated conditions of stack effect and wind effect. Such systems shall comply with Section 909, including, but not limited to, the installation of a control panel as per Section 909.16.

909.22.1 Ventilating equipment. The activation of ventilating equipment for the stair or ramp pressurization system shall be by smoke detectors installed at each floor level at an approved location at the entrance to the smokeproof enclosure. When the closing device for the stairway or ramp shaft and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with Section 907.3.

909.22.1.1 Ventilation systems. Smokeproof enclosure 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 connected to the smokeproof enclosure by ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 707 of the International Building Code or horizontal assemblies constructed in accordance with Section 711 of the International Building Code, or both.

2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour barriers constructed in accordance with Section 707 of the Building Code or horizontal assemblies constructed in accordance with Section 711 of the Building Code, 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 of the International Building Code or horizontal assemblies constructed in accordance with Section 711 of the International Building Code, 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. Control wiring and power wiring protected by a listed electrical circuit protective systems with a fire-resistance rating of not less than 2 hours.

909.22.1.2 Standby power. Mechanical vestibule and stairway and ramp shaft ventilation systems and automatic fire detection systems shall be provided with standby power in accordance with Section 2702 of the International Building Code.

909.22.1.3 Acceptance and testing. Before the mechanical equipment is approved, the system shall be tested in the presence of the fire code official to confirm that the system is operating in compliance with these requirements.

Reason: The intent with this change is to simply duplicate the requirements for a stairwell pressurization system from the International Building Code to the International Fire Code. This change is not intended to make substantive changes to the requirements, but rather to provide the fire code official with the requirements for such systems in the Fire Code for enforcement purposes relative to the Smoke Control Permit required for such systems by 105.7.14 and 909.6.3, both of which were introduced to the code in the 2015 edition.

The elevator pressurization requirements were duplicated in a similar fashion in the 2015 edition of the code, but the stairwell pressurization requirements were not, resulting in some confusion.

Cost Impact: Will not increase the cost of construction

This is simply a duplication of the requirements from the International Building Code into the International Fire Code, so there should be no increase in the cost of construction, as such.
Public Hearing Results

Committee Action: Disapproved

Committee Reason: It was stated that the proposal is incomplete because it does not include all the requirements from the IBC. In addition, it was not clear who would have control of the IBC sections in order to maintain consistency.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Bob Morgan, PE, representing Fort Worth Fire Department requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

909.22 Stairway or ramp pressurization alternative. Where the building is provided with stairway or ramp pressurization in lieu of vestibules for compliance with the International Building Code requirements for a smokeproof enclosure, interior exit stairways or ramps shall be pressurized to not less than 0.10 inches of water (25 Pa) and not more than 0.35 inches of water (87 Pa) in the shaft relative to the building measured with all interior exit stairway and ramp doors closed under maximum anticipated conditions of stack effect and wind effect. Such systems shall comply with Section 909, including, but not limited to, the installation of a control panel as per Section 909.16.

909.22.1 Ventilating equipment. The activation of ventilating equipment for the stair or ramp pressurization system shall be by smoke detectors installed at each floor level at an approved location at the entrance to the smokeproof enclosure. When the closing device for the stairway or ramp shaft and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with Section 907.3.

909.22.1.1 Ventilation systems. Smokeproof enclosure 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 connected to the smokeproof enclosure by ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 707 of the International Building Code or horizontal assemblies constructed in accordance with Section 711 of the International Building Code, or both.

2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour barriers constructed in accordance with Section 707 of the Building Code or horizontal assemblies constructed in accordance with Section 711 of the Building Code, 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 of the International Building Code or horizontal assemblies constructed in accordance with Section 711 of the International Building Code, 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. Control wiring and power wiring protected by a listed electrical circuit protective systems with a fire-resistance rating of not less than 2 hours.

909.22.1.2 Standby power. Mechanical vestibule and stairway and ramp shaft ventilation systems and automatic fire detection systems shall be provided with standby power in accordance with Section 2702 of the International Building Code.

909.22.1.3 Acceptance and testing Testing. Before the mechanical equipment is approved, the system Testing for performance shall be required in the presence of the fire code official to confirm that the system is operating in accordance with Section 909.18.8. System acceptance shall be in accordance with these requirements Section 909.19.

Commenter's Reason: The intent with this change is to simply duplicate the requirements for a stairwell pressurization...
system from the International Building Code to the International Fire Code. This change is not intended to make substantive changes to the requirements, but rather to provide the fire code official with the requirements for such systems in the Fire Code for enforcement purposes relative to the Smoke Control Permit required for such systems by 105.7.14 and 909.6.3, both of which were introduced to the code in the 2015 edition.

The elevator pressurization requirements were duplicated in a similar fashion in the 2015 edition of the code, but the stairwell pressurization requirements were not, resulting in some confusion.

The entire proposal is new text to the Fire Code, but the proposal was changed to help match what is in the Building Code, as requested by the committee. Also, the committee was confused about responsible parties, so the acceptance and testing section was revised to reflect that of the elevator hoistway pressurization section that is already in the Fire Code to avoid such confusion.

**Cost Impact:** Will not increase the cost of construction. This is simply a duplication of the requirements from the International Building Code into the International Fire Code, so there should be no increase in the cost of construction, as such.

F219-16
F220-16
IFC: 910.5, 910.5.1, 910.5.1.1, 910.5.2, 910.5.2.1, 910.5.2.2, 910.5.2.3, 910.5.2.4.

**Proposed Change as Submitted**

Proponent: Michael O’Brien representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code
Revise as follows:

**910.5 Maintenance and testing, Smoke**
Maintenance and testing of smoke and heat vents and mechanical smoke removal systems shall be maintained in an operative condition in accordance with Sections 910.5.1 or 910.5.2. A written record of inspection, respectively, testing and maintenance which includes the date, identification of personnel involved, unsatisfactory result, corrective action taken and replaced parts shall be maintained on the premises.

**910.5.1 Smoke and heat vents.** Smoke and heat vents shall be maintained in an operative condition. Inspection, testing and maintenance shall be in accordance with NFPA 204 and Section 910.5.1.1 except as follows:

1. Mechanically operated smoke and heat vents shall be inspected annually and operationally tested not less than every five years.
2. Gravity drop-out smoke and heat vents shall be inspected annually.
3. Fused, damaged or painted fusible links shall be replaced.

Delete without substitution:

**910.5.1.1 Fusible links.** Fusible links for smoke and heat vents shall be replaced whenever fused, damaged or painted.

Revise as follows:

**910.5.2 Mechanical smoke removal systems.** Mechanical smoke removal systems shall be maintained in accordance with NFPA 204 and the equipment manufacturer's maintenance instructions and Sections 910.5.2.1 through 910.5.2.4, except as follows:

1. Systems shall be inspected and operationally tested annually.
2. Testing shall include the operation of all system components, controls and ancillary equipment, such as make-up air openings.
3. A written schedule for routine maintenance and operational testing shall be established and testing shall be conducted in accordance with the schedule.

Delete without substitution:

**910.5.2.1 Frequency.** Systems shall be operationally tested not less than once per year. Testing shall include the operation of all system components, including control elements.

**910.5.2.2 Testing.** Operational testing of the mechanical smoke removal system shall include all equipment such as fans, controls and make-up air openings.

**910.5.2.3 Schedule.** A routine maintenance and operational testing program shall be initiated and a written schedule for routine maintenance and operational testing shall be established.

**910.5.2.4 Written record.** A written record of mechanical smoke exhaust system testing and maintenance shall be maintained on the premises. The written record shall include the date of the maintenance, identification of the servicing personnel and notification of any unsatisfactory condition and the corrective action taken, including parts replaced.

Reason: Smoke and heat vents, like other fire protection devices, need to be inspected, maintained and tested on a regular basis to ensure proper operation. NFPA 204 is referenced and contains requirements for inspection and testing. NFPA 204 requires annual inspection of mechanically operated smoke and heat vents and gravity drop out smoke and heat vents. Further, NFPA 204 requires annual testing of mechanically operated smoke and heat vents.

The requirements for inspection and testing are proposed to be included in the IFC to provide the inspector with the needed information to require the inspection, testing and maintenance of these devices. However, rather than testing all smoke and heat vents annually, this proposal revises that testing requirement to once every 5 years.

Section 910.5.3 is added as the typical requirement in the IFC for retention of the inspection, maintenance and testing records.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban
interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

**Cost Impact:** Will not increase the cost of construction

Will not increase the cost of construction, but will increase the cost of maintenance where smoke and heat vents are installed.

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**Public Hearing Results**

**Committee Action:** Disapproved

**Committee Reason:** The committee stated that there was a lack of substantiation for the requirement for the parts to remain on the premises and for the mechanical operated smoke and heat vents to be operationally tested not less than every five years in Section 910.5. In addition, it was noted that the word “any” needs to be added before “unsatisfactory result” in Section 910.5 as well.

**Assembly Action:** None

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**Individual Consideration Agenda**

**Public Comment 1:**

Proponent : Michael O'Brian representing Fire Code Action Committee (fcac@iccsafe.org); Jeff Hugo, representing National Fire Sprinkler Association (hugo@nfsa.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

**910.5 Maintenance and testing.** Maintenance and testing of smoke and heat vents and mechanical smoke removal systems shall be maintained in accordance with Sections 910.5.1 and 910.5.2. A written record of inspection, testing and maintenance which includes the date, identification of personnel involved, any unsatisfactory result, corrective action taken and replaced parts shall be maintained on the premises.

**Commenter's Reason:** This public comment addresses the concerns in the committee statement. The phrase "...replaced parts shall be maintained on the premises." was never intended to literally keep the replaced parts on the premises. The sentence structure is revised by adding a comma to separate the sentence to keep the intent that the record or documentation of replaced parts, as well as the other items that are documented to remain on the premises. The purpose of the five year schedule is as stated in the original reason statement, "...rather than testing all smoke and heat vents annually, this proposal revises that testing requirement to once every five years". Testing all smoke and heat vents annually is aggressive and a schedule that is not being enforced. By changing to five years, the matter has a better chance of getting tested and enforced locally. The term "any" was added in front of "unsatisfactory result" as well as the removal of the term "maintained" in the beginning of the charging paragraph. These are minor changes to this revised section to clarify the requirements for inspection, testing and maintenance of smoke and heat vents.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)
Committee Action: Disapproved

Assembly Action: None

F221-16
912.2 (IBC [F] 912.2), 912.2.1 (IBC [F] 912.2.1)

Proposed Change as Submitted

Proponent: Michael O'Brien representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code

912.2 Location. With respect to hydrants, driveways, buildings and landscaping, fire department connections shall be so located installed in an approved location that is adjacent to and clearly visible from a street or fire apparatus access road. A position for fire apparatus supplying the fire department connection shall be identified on construction plans in accordance with Section 501.3. A direct hose lay path from that position to supply the fire department connection shall be provided and shall comply with both of the system will following:

1. The hose-lay path shall not be obstructed by landscaping, walls, fences or other impediments.
2. The hose-lay path shall not obstruct access to the buildings for by other fire apparatus. The location of fire department connections shall be approved by the fire chief.

Delete without substitution:

912.2.1 Visible location. Fire department connections shall be located on the street side of buildings, fully visible and recognizable from the street or nearest point of fire department vehicle access or as otherwise approved by the fire chief.

Reason: This proposal is simply meant as a clarification and enhancement of the existing requirement.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Bibliography: This provides flexibility for designers.

Cost Impact: Will increase the cost of construction
May increase the cost of construction due to clarification of the requirement to provide an unobstructed pathway between fire apparatus and a fire department connection. Although this was implicit in the prior code text, the clarifications provided by this change eliminate the chance for subjective interpretation of the provisions.

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The committee stated that the requirements belong in Chapter 5 and that the provisions would be difficult to determine and enforce.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brien representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Replace Proposal as Follows:

2015 International Fire Code

912.2 Location. With respect to hydrants, driveways, buildings and landscaping, fire department connections shall be so located that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of fire department connections shall be approved by the fire chief.
912.2.1 Visible location. Fire department connections shall be located on the street side of buildings or facing approved fire apparatus access roads, fully visible and recognizable from the street, fire apparatus access road or nearest point of fire department vehicle access or as otherwise approved by the fire chief.

Commenter’s Reason:
The previous code proposal attempted to consolidate two sections into one, and to update wording for a technical reason and for clarity. From the committee responses it was clear that the changes made the code section less clear. This public comment goes back to the current code language, and keeps the two sections separate. A technical change is again proposed, which allows for a fire department connection to be located on any side of the building that faces an approved fire apparatus access road. The current code only allows the fire department connection on the street side of the building, but there are sites where it is advantageous to have the fire department connection on another side of the building. This proposal permits that flexibility, as long as the fire department connection faces an approved fire apparatus access road.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)
Proposed Change as Submitted

2015 International Fire Code

Revise as follows:

915.1 General. Carbon monoxide detection shall be installed in new buildings in accordance with Sections 915.1.1 through 915.6. Carbon monoxide detection shall be installed in existing buildings in accordance with Section 1103.9 Chapter 11.

915.1.1 Where required. Carbon monoxide detection shall be provided in Group A-1, A-2, E, I-1, I-2, I-4 and R occupancies and in classrooms in Group E occupancies in the locations specified in Section 915.2 where any of the conditions in Sections 915.1.2 through 915.1.6 exist.

915.1.2 Fuel-burning appliances and fuel-burning fireplaces. Carbon monoxide detection shall be provided in dwelling units, sleeping units and classrooms and rooms or spaces used for assembly purposes that contain a fuel-burning appliance or a fuel-burning fireplace.

915.1.3 Forced-air furnaces. Carbon monoxide detection shall be provided in dwelling units, sleeping units and classrooms and rooms or spaces used for assembly purposes served by a fuel-burning, forced-air furnace.

Exception: Carbon monoxide detection shall not be required in dwelling units, sleeping units and classrooms where and rooms or spaces used for assembly purposes if carbon monoxide detection is provided in the first room or area served by each main duct leaving the furnace, and the carbon monoxide alarm signals are automatically transmitted to an approved location.

915.1.4 Fuel-burning appliances outside of dwelling units, sleeping units and classrooms. Carbon monoxide detection shall be provided in dwelling units, sleeping units and classrooms and rooms or spaces used for assembly purposes located in buildings that contain fuel-burning appliances or fuel-burning fireplaces.

Exceptions:

1. Carbon monoxide detection shall not be required in dwelling units, sleeping units and classrooms and rooms or spaces used for assembly purposes where there are no communicating openings between the fuel-burning appliance or fuel-burning fireplace and the dwelling unit, sleeping unit or classroom.

2. Carbon monoxide detection shall not be required in dwelling units, sleeping units and classrooms and spaces used for assembly purposes where carbon monoxide detection is provided in one of the following locations:

   1. In an approved location between the fuel-burning appliance or fuel-burning fireplace and the dwelling unit, sleeping unit or classroom.

   2. On the ceiling of the room containing the fuel-burning appliance or fuel-burning fireplace.

915.1.5 Private garages. Carbon monoxide detection shall be provided in dwelling units, sleeping units and classrooms and rooms or spaces used for assembly purposes in buildings with attached private garages.

Exceptions:

1. Carbon monoxide detection shall not be required where there are no communicating openings between the private garage and the dwelling unit, sleeping unit or classroom and rooms or spaces used for assembly purposes.

2. Carbon monoxide detection shall not be required in dwelling units, sleeping units and classrooms and rooms or spaces used for assembly purposes located more than one story above or below a private garage.

3. Carbon monoxide detection shall not be required where the private garage connects to the building through an open-ended corridor.

4. Where carbon monoxide detection is provided in an approved location between openings to a private garage and dwelling units, sleeping units or classrooms and rooms and spaces used for assembly purposes, carbon monoxide detection shall not be required in the dwelling units, sleeping units and classrooms and rooms or spaces used for assembly purposes.

915.2 Locations. Where required by Section 915.1.1, carbon monoxide detection shall be installed in the locations specified in Sections 915.2.1 through 915.2.4.

915.3 Detection equipment. Carbon monoxide detection required by Sections 915.1 through 915.2.4 shall be provided by carbon monoxide alarms complying with Section 915.4 or carbon monoxide detection systems complying with Section 915.5.

Add new text as follows:

915.2.4 Group A occupancies. Carbon Monoxide detectors in accordance with Section 915.5.1 shall be installed in rooms or
spaces used for assembly purposes in Group A-1, A-2 and small assembly occupancies in accordance with Section 303.1.2 of the International Building Code. The carbon monoxide alarm signals shall be automatically transmitted to an onsite location that is staffed by management personnel.

Reason: This proposal seeks to protect the public from serious injury or possibly death from unintentional non-fire related carbon monoxide (CO) exposure by mandating the installation of CO detection devices in A-1 and A-2 assembly occupancies. In the absence of a model fire code for the installation of CO detection in assembly occupancies, many jurisdictions are developing their own regulations with varying installation requirements. For example, as a result of the national publicity generated from an incident at a Long Island New York restaurant that sent 26 to the hospital and tragically killed the restaurant manager,

- New York Governor Cuomo signed AB 8963 (http://assembly.state.ny.us/leg/?default_fld=%0D%0A&bn=A08963&term=2013&Text=Y) into law expanding the state's regulations to include the installation of CO detection in restaurants and other commercial buildings.
- New Jersey Governor Christie signed A 4073 (http://www.njleg.state.nj.us/2014/Bills/A4500/4073_R1.PDF) into law requiring the installation of CO detection devices in all commercial structures not currently required to have such protection. The measure applies to structures having a potential for a CO hazard. At present CO detection is required in hotels, one- and two-family dwellings and apartment buildings upon initial occupancy or change of occupancy.
- The NFPA 101/5000 Assembly Technical Committee created First Revision #10 that requires CO detection in assembly occupancies with permanently installed fuel-burning appliances or attached garages.

The following states introduced legislation requiring CO detection in commercial occupancies:
- CT 5532 (http://www.cga.ct.gov/2015/TOB/H/2015HB-05532-R00-HB.htm): Amends part II of chapter 541 of the general statutes to require any person doing business in the state to equip the place of business physically located in this state with carbon monoxide detection and warning equipment.

This proposal models the location requirements for assembly occupancies after the current requirements in the 2015 edition of the IFC for CO detection in hotels, dormitories, apartment buildings and schools as a basis. The efficacy of voluntary national consensus codes, such as the IFC, ensures a collaborative, balanced, and consensus-based process.

Bibliography:

VA Staunton 08/23/07 Restaurant Fire officials shut down the Staunton Applebee's after several people became sick. Medical crews cared for at least seven people—all were Applebee's employees. Faulty ventilator

MD Baltimore 02/02/08 Restaurant The restauranat was evacuated after employees began to feel faint, dizzy and nauseous. The Fire Dept responded and took a reading of 400 ppm. Lawsuit resulted in $33M award to injured employees. Boiler's heat exchanger

OK Tulsa 12/10/08 Restaurant After complaining of feeling ill, officials say four employees were sent home from Charleston's Tuesday. Emergency workers transported eight people to area hospitals, Nassau University Medical Center and North Shore University Hospitals in Syosset and Plainview, suffering from carbon monoxide poisoning. Three other people sustained carbon monoxide poisoning, but refused medical attention.

NY Plainview 11/10/09 Restaurant Six people were transported to Massachusetts General Hospital in Boston this afternoon for breathing in carbon monoxide coming from the unknown vents at La Rotisserie on Boylston Street in Newton.

MA Newton 09/28/10 Restaurant The Golden Corral restaurant was evacuated this afternoon as a result of a carbon monoxide leak, according to Mercer County 911 Center. A handful of people were taken to the hospital for treatment.

PA Hermitage 11/12/10 Restaurant Four guests at the neighboring Marriott Marquis fell ill Thursday night after a water heater in Amber India leaked high amounts of carbon monoxide into the hotel walls at 250 ppm.

CA San Francisco 01/09/11 Restaurant Broken heater
<table>
<thead>
<tr>
<th>State</th>
<th>Location</th>
<th>Date</th>
<th>Type</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA</td>
<td>Pooler</td>
<td>09/14/11</td>
<td>Restaurant</td>
<td>Carbon monoxide leaking into the walls of a Pooler McDonald's caused an 80-year-old woman to die.</td>
</tr>
<tr>
<td>KS</td>
<td>Olathe</td>
<td>11/07/11</td>
<td>Restaurant</td>
<td>Medical crews were called to Noodles &amp; Company, 15208 W. 119th St., in Olathe, shortly after 11 a.m. Monday. Olathe police and fire, Lenexa fire, and paramedics from Johnson County Med-Act responded to the scene. The restaurant had been evacuated.</td>
</tr>
<tr>
<td>NY</td>
<td>Great Neck</td>
<td>01/26/12</td>
<td>Restaurant</td>
<td>More than 40 employees and patrons were evacuated from Bruce’s Restaurant and Bakery in Great Neck last week after firefighters failed to find the source of a carbon monoxide leak, which ultimately sent three people to local hospitals.</td>
</tr>
<tr>
<td>VA</td>
<td>Hampton</td>
<td>08/28/12</td>
<td>Restaurant</td>
<td>Hampton HAZMAT crews responded to a report of a carbon monoxide leak at Sam Rust Seafood at 9 am.</td>
</tr>
<tr>
<td>TN</td>
<td>Germantown</td>
<td>09/05/12</td>
<td>Restaurant</td>
<td>Employees from 9 businesses at a shopping center evacuated due to CO leak coming from a Chili's restaurant. CO gas traveled through the air ducts.</td>
</tr>
<tr>
<td>TN</td>
<td>Johnson City</td>
<td>12/28/12</td>
<td>Restaurant</td>
<td>Emergency crews rushed to the Golden Corral after two children passed out. Once they arrived, several more children fell unconscious. In all, Mountain States Health Alliance says it treated 16 people at two of its hospitals, eight adults, eight children for Carbon Monoxide exposure.</td>
</tr>
<tr>
<td>IA</td>
<td>Storm Lake</td>
<td>03/28/13</td>
<td>Restaurant</td>
<td>The Storm Lake Fire Department, police and Alliant Energy responded to a Burger King outlet on Tuesday night after an odor of natural gas was reported. The restaurant had been evacuated. Four people were taken to the hospital, four with &quot;dangerously high&quot; carbon monoxide levels in their blood, after police and fire officials responded to a call Tuesday afternoon to a Dominican restaurant in Garden City Park.</td>
</tr>
<tr>
<td>NY</td>
<td>Garden City</td>
<td>04/25/13</td>
<td>Restaurant</td>
<td>Seven people were taken to the hospital, four with &quot;dangerously high&quot; carbon monoxide levels in their blood, after police and fire officials responded to a call Tuesday afternoon to a Dominican restaurant in Garden City Park.</td>
</tr>
<tr>
<td>WI</td>
<td>Sheboygan</td>
<td>06/15/13</td>
<td>Restaurant</td>
<td>Hardee's, located at 4409 Highway 42, was evacuated shortly after 8 AM due to a gaseous smell in the restaurant. The Town of Sheboygan Fire Department responded to investigate. Earlier in the morning, Wisconsin Public Service was called to investigate a possible gas leak in the building.</td>
</tr>
<tr>
<td>OR</td>
<td>Portland</td>
<td>07/06/13</td>
<td>Restaurant</td>
<td>A Southwest Portland restaurant was evacuated after a cooling unit began leaking carbon monoxide into the building.</td>
</tr>
<tr>
<td>NC</td>
<td>Greensboro</td>
<td>01/04/14</td>
<td>Restaurant</td>
<td>A leaky flue killed manager, Steven Nelson, 55, who was overcome in the basement of the Legal Sea Food restaurant at the Walt Whitman Mall. The restaurant had been evacuated. Seven people were taken to the hospital, four with &quot;dangerously high&quot; carbon monoxide levels in their blood, after police and fire officials responded to a call Tuesday afternoon to a Dominican restaurant in Garden City Park.</td>
</tr>
<tr>
<td>WI</td>
<td>Cottage Grove</td>
<td>03/03/14</td>
<td>Restaurant</td>
<td>The incident happened just before 6 a.m. at the McDonald's in the 400 block of West Cottage Grove Road. According to dispatch, the restaurant was evacuated after the carbon monoxide alarms went off inside.</td>
</tr>
<tr>
<td>PA</td>
<td>Norristown</td>
<td>03/04/14</td>
<td>Restaurant</td>
<td>Family was asleep in their apt as CO was seeping in from the restaurant below. They woke up feeling nauseous and called 9-1-1.</td>
</tr>
<tr>
<td>CO</td>
<td>Denver</td>
<td>03/16/14</td>
<td>Restaurant</td>
<td>Multiple customers reported headaches and nausea at a Noodles &amp; Company.</td>
</tr>
<tr>
<td>MA</td>
<td>Boston</td>
<td>03/25/14</td>
<td>Restaurant</td>
<td>Legal Sea Foods and The Cottage in Chestnut Hill was evacuated following high carbon monoxide readings in the restaurants. A nearby restaurant, The Cottage, was also evacuated.</td>
</tr>
<tr>
<td>NY</td>
<td>Long Island</td>
<td>06/02/14</td>
<td>Restaurant</td>
<td>The incident happened just before 6 a.m. at the McDonald's in the 400 block of West Cottage Grove Road. According to dispatch, the restaurant was evacuated after the carbon monoxide alarms went off inside.</td>
</tr>
<tr>
<td>VA</td>
<td>Henrico</td>
<td>06/14/14</td>
<td>Restaurant</td>
<td>Henrico Fire units responded to the China House restaurant for a report of the smell of gas and a generator running inside of a closed business during power outage.</td>
</tr>
</tbody>
</table>

In all, Mountain States Health Alliance says it treated 16 people at two of its hospitals, eight adults, eight children for Carbon Monoxide exposure. A leaky flue killed manager, Steven Nelson, 55, who was overcome in the basement of the Legal Sea Food restaurant at the Walt Whitman Mall. The restaurant had been evacuated. Seven people were taken to the hospital, four with "dangerously high" carbon monoxide levels in their blood, after police and fire officials responded to a call Tuesday afternoon to a Dominican restaurant in Garden City Park. Air ducts.
Two Long Island volunteer EMTs sat down to get dinner at their local Applebee's in Hauppauge when their carbon monoxide detector they were carrying delivered a reading that registered twice the safe limit. A faulty hood vent led to a potentially dangerous carbon monoxide situation at Bruegger's. People involved first became aware of the problem after one man drove himself to the emergency room Sunday night. Emergency personnel evacuated two restaurants late due to the presence of high carbon monoxide levels within the building that they share. Some 10 to 12 people were evacuated from the Local Burger and Banh Mi Saigon restaurants. The restaurant was evacuated. Manchester Fire detected high carbon monoxide readings as a result of a malfunctioning heating, ventilating, and air conditioning system.

### Public Hearing Results

**Committee Action:** Disapproved

**Committee Reason:** The committee stated that they disagree with the method of bringing Group A-1 and A-2 occupancies into the requirement. It is incomplete and should consider more Group A occupancies. In addition, it was noted that the installation standard and technical requirements are not ready.

**Assembly Action:** None

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**Individual Consideration Agenda**

**Public Comment 1:**

*Proponent : Don Davies (don.davies@slcgov.com); Richard Roberts, representing Honeywell (richard.roberts@systemsensor.com) requests Approve as Modified by this Public Comment.*

**Modify as Follows:**

**2015 International Fire Code**

**915.1 Where required.** Carbon monoxide detection shall be provided in Group A-1, A-2, E, I-1, I-2, I-4 and R occupancies and in classrooms in Group E occupancies and occupiable spaces within restaurants in the locations specified in Section 915.2 where any of the conditions in Sections 915.1.2 through 915.1.6 exist.

**915.1.2 Fuel-burning appliances and fuel-burning fireplaces.** Carbon monoxide detection shall be provided in dwelling units, sleeping units and classrooms and rooms or occupiable spaces used for assembly purposes within restaurants that contain a fuel-burning appliance or a fuel-burning fireplace.

**915.1.3 Forced-air furnaces.** Carbon monoxide detection shall be provided in dwelling units, sleeping units and classrooms and rooms or occupiable spaces used for assembly purposes within restaurants served by a fuel-burning, forced-air furnace. **Exception:** Carbon monoxide detection shall not be required in dwelling units, sleeping units and classrooms and rooms or occupiable spaces used for assembly purposes within restaurants if carbon monoxide detection is provided in the first room or area served by each main duct leaving the furnace, and the carbon monoxide alarm signals are automatically transmitted to an approved location.
915.1.4 Fuel-burning appliances outside of dwelling units, sleeping units and classrooms. Carbon monoxide detection shall be provided in dwelling units, sleeping units and classrooms and rooms or occupiable spaces used for assembly purposes within restaurants located in buildings that contain fuel-burning appliances or fuel-burning fireplaces.

Exceptions:
1. Carbon monoxide detection shall not be required in dwelling units, sleeping units and classrooms and rooms or occupiable spaces used for assembly purposes within restaurants where there are no communicating openings between the fuel-burning appliance or fuel-burning fireplace and the dwelling unit, sleeping unit or classroom and occupiable spaces within restaurants.
2. Carbon monoxide detection shall not be required in dwelling units, sleeping units and classrooms and occupiable spaces used for assembly purposes within restaurants where carbon monoxide detection is provided in one of the following locations:
   2.1. In an approved location between the fuel-burning appliance or fuel-burning fireplace and the dwelling unit, sleeping unit or classroom and rooms for occupiable spaces used for assembly purposes within restaurants.
   2.2. On the ceiling of the room containing the fuel-burning appliance or fuel-burning fireplace.

915.1.5 Private garages. Carbon monoxide detection shall be provided in dwelling units, sleeping units and classrooms and rooms or occupiable spaces used for assembly purposes within restaurants in buildings with attached private garages.

Exceptions:
1. Carbon monoxide detection shall not be required where there are no communicating openings between the private garage and the dwelling unit, sleeping unit or classroom and rooms or occupiable spaces used for assembly purposes within restaurants.
2. Carbon monoxide detection shall not be required in dwelling units, sleeping units and classrooms and rooms or occupiable spaces used for assembly purposes within restaurants located more than one story above or below a private garage.
3. Carbon monoxide detection shall not be required where the private garage connects to the building through an open-ended corridor.
4. Where carbon monoxide detection is provided in an approved location between openings to a private garage and dwelling units, sleeping units or classrooms or rooms and occupiable spaces used for assembly purposes within restaurants, carbon monoxide detection shall not be required in the dwelling units, sleeping units or classrooms and rooms, or occupiable spaces used for assembly purposes within restaurants.

915.2 Locations. Where required by Section 915.1.1, carbon monoxide detection shall be installed in the locations specified in Sections 915.2.1 through 915.2.4.

915.2.4 Group A occupancies. Restaurants. Carbon Monoxide detectors in accordance with Section 915.5.1 shall be installed in rooms or occupiable spaces used for assembly purposes in Group A-1, A-2 and small assembly occupancies in accordance with Section 303.1.2 of the International Building Code within restaurants. The carbon monoxide alarm signals shall be automatically transmitted to an onsite location that is staffed by management personnel.

Commenter's Reason: It is reasonable to scope mandatory CO detection requirements to restaurant only, since restaurants with their cooking appliances have been a source of at least two CO poisoning fatalities that sent 84 people to the hospital and evacuated 182 people. This comment follows the general direction being taken by the original proponent's proposal, improves the wording so it is consistent with the Section 915 format, while eliminating providing CO detection in Group A-1 and A-2 occupancies and small assembly occupancies (Section 303.1.2 of the IBC).

Proponent: Thomas Daly, The Hospitality Security Consulting Group, LLC, representing American Hotel & Lodging Association (tom.daly@thehscg.com) requests Disapprove.

Commenter's Reason: The Fire Code Committee's action is correct as the proposal does not differentiate assembly occupancies with cooking facilities (i.e., with fuel-fired appliances) from those without. There is no negative CO exposure history for assembly occupancies without fuel-fired appliances. The code change would impose significant costs on such occupancies for no likely benefits. The code change should be disapproved.

Thomas G. Daly MSc. CSP
Principal
The Hospitality Security Consulting Group, LLC
Committee Action: Disapproved

Assembly Action: None

Proposed Change as Submitted

Proponent: Carl Baldassarra, P.E., FSFPE, representing the Code Technology Committee (CTC@iccsafe.org)

2015 International Fire Code

Revise as follows:

915.1.1 Where required. Carbon monoxide detection shall be provided in Group I-1, I-2, I-4 and R occupancies, and in classrooms in Group E and I-4 occupancies in the locations specified in Section 915.2 where any of the conditions in Sections 915.1.2 through 915.1.6 exist.

915.2.3 Group E occupancies. Carbon monoxide detection shall be installed in classrooms in Group E or I-4 occupancies. Carbon monoxide alarm signals shall be automatically transmitted to an on-site location that is staffed by school personnel.

Exception: Carbon monoxide alarm signals shall not be required to be automatically transmitted to an on-site location that is staffed by school personnel in Group E or I-4 occupancies with an occupant load of 30 or less.

Reason: The intent of this proposal is to clarify where carbon monoxide detection is required in day care facilities. Day care facilities consist of classrooms or defined spaces, regardless if the children are over 2-1/2 years of age or under. The change of I-4 to Section 915.2.3 for locating detectors in classrooms rather than dwelling units or sleeping units (915.2.1 or 915.2.2) is clearer. This proposal is submitted by the ICC Code Technology Committee (CTC). The ICC Board has decided to sunset the CTC. The sunset plan includes re-assigning many of the CTC Areas of Study to the applicable Code Action Committee (CAC). The two remaining CTC Areas of Study are Care Facilities and Elevator Lobbies/WTC Elevator issues. This proposal falls under the Care Facilities Area of Study. In 2014 and 2015 ICC CTC Committee has held 4 open meetings and numerous Work Group meetings and conference calls for the current code development cycle which included members of the committees as well as any interested party to discuss and debate the proposed changes. Information on the CTC, including: the sunset plan; meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the CTC website CTC (http://www.iccsafe.org/cs/CTC/Pages/default.aspx).

Cost Impact: Will not increase the cost of construction

This is a clarification of requirements so no change in construction requirements.

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The committee stated that the proposal was incomplete because it only includes the classrooms in Group E occupancies and not in the fuel fired equipment rooms, which would provide more detection. In addition, because of the use of “and” in section 915.1.1 and “or” in section 915.2.3 as well as the section title of 915.2.3, is not clear what is required in Group I-4 occupancies.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Carl Baldassarra, P.E., FSFPE, representing Code Technologies Committee (CTC@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

915.2.3 Group E occupancies. Carbon monoxide detection shall be installed in classrooms in Group E or I-4 occupancies. Carbon monoxide alarm signals shall be automatically transmitted to an on-site location that is staffed by school personnel.

Exception: Carbon monoxide alarm signals shall not be required to be automatically transmitted to an on-site location that is staffed by school personnel in Group E or I-4 occupancies with an occupant load of 30 or less.
Commenter's Reason: The committee disapproved that change because they wanted Group E facilities to have a carbon monoxide detector in a room with a fuel fired appliance. There is a requirement for that in Section 915.1.4, so there is no reason to repeat that. The intent of the proposal remains strictly a clarification for day care facilities regarding where carbon monoxide detectors are required. Day care facilities have classrooms, not sleeping rooms, so moving the Group I-4 with the Group E requirments is appropriate. To address the committees concern for 'and' versus 'or', the proposal has been revised to just use 'and'.
Proposed Change as Submitted

Proponent: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2015 International Fire Code

Add new text as follows:

CHAPTER PART 916 — GAS DETECTION SYSTEMS

916.1 Gas detection system activation. Where a gas detection system is required elsewhere in this code, a gas detection alarm shall be initiated when any sensor detects a concentration of gas exceeding the following thresholds:

1. For flammable gases, a gas concentration exceeding 25 percent of the lower flammable limit (LFL).
2. For non-flammable gases, a gas concentration exceeding 1/2 of the IDLH, unless a different threshold is specified by the section of this code requiring gas detection.

Upon activation of a gas detection alarm, alarm signals or other required responses shall be as specified by the section of this code requiring a gas detection system. Audible and visible alarm signals associated with a gas detection alarm shall be distinctive from fire alarm and carbon monoxide alarm signals.

Reason: This proposal is a companion change to the FCAC proposal that adds a new Section 916 on gas detection systems. It adds a baseline detection threshold of 1/2 IDLH for non-flammable gases that require gas detection under other code sections, should a detection threshold not otherwise be specified by such sections. IDLH is a concentration that would allow an exposed individual 30 minutes to self evacuate, so half of that concentration is a conservative threshold for initiating an evacuation alarm associated with the risk of a pending acute hazard. Specifying this value will also make it clear that it is not the intent of the IFC to begin broadly regulating non-flammable gases that have no other IFC/IBC regulated physical or health hazard characteristics based on chronic exposures in a work environment (i.e. PEL or TLV/TWA values). That is the purview of OSHA, not the fire code.

Cost Impact: Will not increase the cost of construction
This proposal does not add additional construction requirements.

Committee Action: Approved as Submitted
Committee Reason: This proposal was approved as it was consistent with code change proposal F75-16.

Individual Consideration Agenda

Public Comment 1:
Proponent: Jeffrey Shapiro, International Code Consultants, representing Self (jeff.shapiro@intlcodeconsultants.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

916.1 Gas detection system activation. Where a gas detection system is required elsewhere in this code, a gas detection alarm shall be initiated when any sensor detects a concentration of gas exceeding the following thresholds:

1. For flammable gases, a gas concentration exceeding 25 percent of the lower flammable limit (LFL).
2. For non-flammable gases, a gas concentration exceeding 1/2 of the IDLH, unless a different threshold is specified by the section of this code requiring gas detection.

Upon activation of a gas detection alarm, alarm signals or other required responses shall be as specified by the section of this code requiring a gas detection system. Audible and visible alarm signals associated with a gas detection alarm shall be distinctive from fire alarm and carbon monoxide alarm signals.
Commenter's Reason: The proposed modifications are for correlation with the section numbering and terminology used in Code Change F75-16, which was recommended for Approval as Submitted by the IFC Code Development Committee. This code change will modify Section 916.8 in F75-16 to specify that the alarm activation threshold for a non-flammable gas will be 1/2 of the IDLH value unless the section of the code requiring gas detection specifies a different value, which is typically the case. This comment should be considered after any comments to F75-16.

Analysis: Note that if F75-16 is disapproved this PC would no longer be necessary.
Mass Notification System. A construction permit is required to install a Mass Notification System.

Mass Notification System. A system that provides information and instructions to people inside buildings, outdoors areas or other spaces.
SMOKE ALARM.
SMOKE DETECTOR.
STANDPIPE SYSTEM, CLASSES OF.
Class I system.
Class II system.
Class III system.
STANDPIPE, TYPES OF.
Automatic dry.
Automatic wet.
Manual dry.
Manual wet.
Semiautomatic dry.
SUPERVISING STATION.
SUPERVISORY SERVICE.
SUPERVISORY SIGNAL.
SUPERVISORY SIGNAL-INITIATING DEVICE.
TIRES, BULK STORAGE OF.
TRANSIENT AIRCRAFT.
TROUBLE SIGNAL.
VISIBLE ALARM NOTIFICATION APPLIANCE.
WET-CHEMICAL EXTINGUISHING AGENT.
WIRELESS PROTECTION SYSTEM.
ZONE.
ZONE, NOTIFICATION.

SECTION 916 MASS NOTIFICATION SYSTEM

916.1 General. Mass notification systems shall be installed, tested and maintained per NFPA 72.

Reason: Currently these systems are being installed in large complexes like hospitals, business campuses, and colleges to name a few. At this time the IFC does not require this type of system to be reviewed or approved by the AHJ. In order to design and install these systems the AHJ needs to be part of the design. The local AHJ, Police, Fire EMS will be responding to an event when this system in being used. Please note that this new code section does not require this system it will only require them to comply with NFPA 72.

Cost Impact: Will increase the cost of construction
The cost will increase due to the fact that now when a system is being installed the local AHJ will be reviewing the system to make sure that the system is installed per NFPA 72

Public Hearing Results

Committee Action: Disapproved
Committee Reason: Disapproval was based upon the action on code change proposal F228-16 and the lack of a threshold for the requirement.
Assembly Action: None

Individual Consideration Agenda

Public Comment 1:
Proponent: Joseph McElvaney, Jr, representing self (joe.mcelvaney@phoenix.gov) requests Approve as Modified by this Public Comment.
Replace Proposal as Follows:
2015 International Fire Code

SECTION 916 MASS NOTIFICATION SYSTEM
916.1 General. Where a nonrequired mass notification system is provided, it shall be installed, tested and maintained in accordance with NFPA 72. A risk analysis shall be completed, reviewed and approved by the fire code official.

Commenter's Reason: This new section would require that where mass notification systems are installed voluntarily, they are to be installed in accordance with NFPA 72. This new section DOES NOT require a mass notification system.
EMERGENCY COMMUNICATION SYSTEM. A system for the protection of life and property by indicating the existence of an emergency situation and communicating information necessary to facilitate an appropriate response and action.

EMERGENCY RESPONSE PLAN. A documented set of actions to address the planning for, management of, and response to natural, technological, and man-made disasters and other emergencies. Examples include but not limited to fire safety, evacuation and lockdown plans.

105.7.5 Emergency communication system. A construction permit is required for installation of or modification to emergency communication systems and related equipment. Maintenance performed in accordance with this code is not considered to be a modification and does not require a construction permit.

SECTION 916 EMERGENCY COMMUNICATION SYSTEMS

916.1 Mass Notification An approved Emergency Communication System incorporating mass notification shall be provided for the following occupancies when required by a Risk Analysis prepared in accordance with 916.3. The emergency communication system shall comply with Sections 916.2 through 916.5.

Required Occupancies:
1. New Group E occupancies
2. New college-university Group B occupancies
3. New college-university Group A occupancies
4. New college-university Group R-2 occupancies operated by a college or university for student or staff housing

Exception: Occupancies with an occupant load of 100 or less.

916.2 Permit Construction permit shall be required to install emergency communication systems as set forth in Section 105.7.5.

916.3 Risk Analysis A risk analysis and the emergency communication provisions of mass notification and emergency response plan shall be in accordance with NFPA 72, Section 24.3.11.

916.3.1 Approval A risk analysis shall be submitted to the Fire Code Official for approval.

916.4 System design Emergency communication systems shall be selected and designed based upon the completed emergency response plan, and input provided by the school administration, law enforcement agencies responsible for the facility and the fire code official.

916.5 Installation, testing and maintenance. Emergency communication systems shall be installed, tested and maintained in accordance NFPA 72 and applicable requirements in this code.

Reason: The need for real-time effective emergency communications in the United States came into sharp focus in the 20th century in response to threats to homeland security and our educational occupancies. We have learned from the recent incidents that occurred in our college/university campuses and other buildings, and have created installation guidelines to be followed for Life Safety. [Aurora, CO. Theater 2012; Columbine 1999; Virginia Tech 2007; Sandy Hook 2012; Weather Tornadoes/Storms]

There are no national code requirements for these systems. That is causing issues with owners that understand they need improved emergency communications to the masses, and are taking steps that they think may be of value, but in some cases are not due to lack of codes and standards enforcement.
This mission was presented to the FCAC by the CCFS Center for Campus Fire Safety; their survey and research of their national membership showed the need for codes in this area for educational/college/university applications. This is considered a very important first step in Life Safety in these areas.

This code change proposal provides a requirement that a Risk Analysis and an Emergency Response Plan be created for every new educational occupancy and every new A, B occupancy for colleges and universities and new R-2 -occupancies operated by a college or university for student or staff housing.

If the completed Risk Analysis indicates that an Emergency Communication System is warranted for the occupancy, this proposal then provides a process for obtaining a permit from the fire code official and refers to NFPA 72 for system installation and maintenance.

When a mass disaster event occurs, and they are occurring, the need for real time information communicated in a clear and concise method via various paths is very critical to Life Safety. The Risk Analysis and the Emergency Response Plan have been shown to be the needed steps to take in this complicated life safety concern today and in the future.

NFPA 72 National Fire Alarm and Signaling Code has a chapter dedicated to Emergency Communication Systems. The information/requirements for Risk Analysis and qualifications for those performing these services are within NFPA 72; they are matured and are in the 3rd cycle of revisions.

This is NOT intended to require a Mass Notification System in every educational occupancy. There are many elements contained within a Mass Notification System, the process of the Risk Analysis will outline what is needed based on Risk and engineering study for the occupancy. It will be the responsibility of the engineer/designer of the education occupancy to perform and then react to the Risk Analysis.

There are some new terms being introduced and the industry is evolving. The proposed definitions are intended to assist the reader and code enforcer. ECS-Emergency Communication Systems are the major/overall classification. It covers One Way, Two Way, Wide Area (outside) In-Building Mass Notification and Distributed Recipient (Cell phone, laptop) forms of communication. All of this is covered in detail in NFPA 72. Mass Notification is a subset of ECS for all hazards concerns. Another is EVACS which is the Em Voice Alarm Communication System which is defined for FIRE incidents, and now can be utilized for mass notification.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Cost Impact: Will increase the cost of construction
The cost for conducting a Risk Analysis would range from $5,000 to $15,000 per building depending on complexity.

Committee Action: Disapproved
Committee Reason: The committee had concern over the risk analysis requirement, the application for Group B occupancies, and the location and ownership of campus buildings. The proposal as submitted has too many flaws and has the potential for misapplication.

Assembly Motion: As Submitted
Online Vote Results: Successful
Support: 76.1% (433) Oppose: 23.9% (136)
Assembly Action: Approved as Submitted

Individual Consideration Agenda

Public Comment 1:
Proponent: Michael O'Brian representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Replace Proposal as Follows:

2015 International Fire Code

SECTION 916 MASS NOTIFICATION SYSTEMS

916.1 College and University Campuses. Prior to construction of a new building requiring a fire alarm system on a multi-building college or university campus having a cumulative building occupant load of 1,000 or more, a mass notification risk analysis shall be conducted in accordance with NFPA 72. Where the risk analysis determines a need for mass notification, an approved mass notification system shall be provided in accordance with the findings of the risk analysis.

Commenter's Reason: F228 was disapproved by the Fire Safety Committee at the Louisville Hearings. It lost by a very close margin, and we requested an Assembly Action which allowed all of the ICC membership to vote online on this code change. The results are 76.1% SUPPORT of the original proposal and 23.9% oppose the original proposal. This shows there is significant interest and support for this concept.

Over a dozen stakeholders, life safety experts and code officials have worked to reduce the scope of this code change proposal and provide the above language that will provide life safety benefit to our nations educational campuses.

This mission was originally presented to the FCAC by the CCFS Center for Campus Fire Safety; their survey and research of their national membership showed the need for codes in this area for higher education campus operations.

The need for real-time effective emergency communications in the United States came into sharp focus in the 20th century in response to threats to homeland security and our educational occupancies. We have learned from the recent incidents that occurred in our college/university campuses and other buildings, and have created installation guidelines to be followed for Life Safety. [Aurora, CO. Theater 2012; Columbine 1999; Virginia Tech 2007; Sandy Hook 2012; Weather Tornadoes/Storms]

When a mass disaster event occurs, and they are occurring, the need for real time information communicated in a clear and concise method via various paths is very critical to Life Safety. The Risk Analysis and the Emergency Response Plan have been shown to be the needed steps to take in this complicated life safety concern today and in the future.

There are no national code requirements for these systems. That is causing issues with owners that understand they need improved emergency communications to the masses, and are taking steps that they think may be of value, but in some cases are not due to lack of codes and standards enforcement.

This action will NOT require a mass notification system to be installed; it requires the Risk Analysis which is outlined in detail within NFPA 72. That analysis prepared by a registered design professional along with stakeholders of the college and AHJ that will outline what is needed for this location and application.

This code change proposal provides a requirement that a Risk Analysis be created for every new building of size that requires a fire alarm system in college's campuses. This trigger was included so that not any new building would be affected, just those that have already been shown to need a level a life safety.

NFPA 72 National Fire Alarm and Signaling Code has a chapter dedicated to Emergency Communication Systems-Mass Notification. The information/requirements for Risk Analysis and qualifications for those performing these services are within NFPA 72; they are matured and are in the 3rd cycle of revisions.

Mass Notification can cover One Way, Two Way, Wide Area (outside) In-Building Mass Notification and Distributed Recipient (Cell phone, laptop) forms of communication. All of this is covered in detail in NFPA 72. Mass Notification is a subset of ECS for all hazards concerns. Another is EVACS which is the Em Voice Alarm Communication System which is defined for FIRE incidents, and now can be utilized for mass notification.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference
calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Proponent: Assembly Motion requests Approve as Submitted.

Commenter's Reason: This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly motion. The assembly action for Approve as Submitted was Successful by a vote of 76.1% (433) to 23.9% (136) by eligible members online during the period of May 11 - May 26, 2016.

Proponent: Billie Zidek, APPA, representing APPA requests Disapprove.

Commenter's Reason: The APPA I-Codes Work Group and the APPA Standards and Code Council voted to oppose this proposal because;

- The proponents of this change say it is meant to only apply to new construction, and applied only in that instance. But what good is a mass notification system if it is only present in one building and only grows when another new building is built? Given the extensive lifetimes expected for most educational structures, it could take 100 years to build an effective system.
- There is no set or standard format with clear cut parameters for conducting a risk analysis, or predicting if one might conclude a mass notification system might be required for a given project. NFPA 72 provides a list of 8 sources that could be used in conducting a risk analysis including; the Department of Defense: "Target Analysis & Vulnerability Assessment Methodology", "General Security Risk Assessment Guide" published by a heavy industry trade group, the "Responsible Care Code" published by the American Chemical Council for industrial chemical facilities, "Risk, Resilience, and Management of Water Works" by the American Water Works Association, "Vulnerability Assessment Methodology for Critical Asset Protection" by a private company, Safeplace Corp., "Vulnerability Assessment Methodology" by Sandia Labs for nuclear technology, and two NFPA Standards, 1600 & 730. Obviously, most of the guides are targeted at a far different type and level than educational occupancies, and even the two NFPA Standards provide no clear cut method of determining if a mass notification system is warranted or not.
- In the justification for the proposal, the proponent states that it would be the responsibility of the project engineer/architect/designer to conduct the risk analysis and react to it's findings. However, that language is not found in the actual text. There is however language in NFPA 72 that permits "a professional installer", the very entity who would profit from a finding of risk, to prepare a risk analysis on their own or for a designer as a sub-consultant. We would submit that most professional design firms will not consider themselves to have necessary expertise on staff, and would opt to sub-contract that work and pass the cost on with a multiplier. Given the lack of objective criteria for making a determination, and the potential liability for declaring a Mass Notification System not needed, we would expect most consultants would tend to err on the conservative side and find that an MNS is needed, which in most cases also serve the additional benefit of increasing their fee for the project where the fee is a percentage of the construction cost. This is also true for the contractor and sub-contractor if the need is only identified after plans are drawn and contracts signed.
- In addition to the cost to the institution to conduct the risk analysis study, (which the proponent estimates at $5,000 to $15,000, but experience tells might be more like $10,000 to $50,000), if the institution doesn't currently have an Emergency Response Plan, there would an cost incurred to create that plan as well which could easily double the expense. The proponent indicated a willingness to include a clause that where a previous risk analysis had been conducted a subsequent building would not necessarily trigger the need for a new one, but this may be overridden by NFPA 72 that stresses that each building introduces it's own set of considerations that need to be evaluated.
- Many institutions have already conceptualized, crafted, and installed mass notification systems of their own design. None of these existing systems would be grandfathered or permitted to remain unless they fully conformed to NFPA 72.
- The definitions between "emergency voice/alarm communications" and "emergency communications system" are so close to one another as to be indistinguishable from one another. This could be justification to make mass notification systems the sole province of fire alarm manufacturers and contractors.
- The terms "college" and "university" are not defined in the IFC, nor how they would be distinguished from trade schools, apprenticeship and internship programs.
- Why are only educational occupancies targeted for this requirement? The proponents themselves cite the Aurora Colorado movie theater shooter as an incentive for their measure, yet movie theaters are not covered. Nor are concert venues, corporate lunchrooms, night clubs, grocery stores and shopping malls, transportation facilities, or restaurants, all targets of recent attacks. The proponent has offered to include language that would exempt off-campus leased space, but
what about off-campus owned facilities? What about private developer student housing? As of now they wouldn't require a system even though it could stand right next to an identical college owned housing building that would be obligated.

- The proponent also offers an exemption for buildings with a total occupancy of 100 or less. That is not very useful as almost any building from a greenhouse to motor pool is going to be capable of containing 100 or more. Moreover, how is this number to be calculated? The code provides ways to calculate occupancy in assembly spaces, but that is not attempted for offices, work spaces, storage rooms, and other such spaces to arrive a building total. As written, a building containing 2 ½ standard sized elementary classrooms would exceed the threshold.

- In addition to the costs of the studies, and the mass notification system itself, NFPA 72 requires that where there are one or more buildings on the same property (a campus) that a command center be built where all of the components of the mass notification system are home run to (even if that constitutes only one building) and that there also be a back-up secondary command center at a second location if the primary location is involved in the emergency. And furthermore that the command center be staffed 24/7 by trained staff. NFPA 72 also provides the local first responders, police, and AHJ to make certain scope decisions about the extent and characteristics of the system at the Owner's expense such as provisions for secure communications.

- The comparative system costs may increase also depending on the type, what's included, and how executed. Typical horn/strobe fire alarm systems can adequately communicate a non-verbal emergency evacuation message by increasing volume while decreasing the spacing between devices thereby lowering the total number of devices to be purchased and wired and less total length of wire and conduit. The in-building portion of mass notification systems expect a customized announcement will be conveyed in an emergency requiring less volume but a greater density of speaker strobes to provide voice intelligibility. This results in more total devices and more wiring.

- As noted in the background information provided above, this proposal was originally disapproved by the Technical Action Committee, but the Proponent sought to have the Committee's recommendation overturned to bring the proposal back for consideration for inclusion by introducing a floor motion to that effect, which is permitted. It was not widely known what measures were being challenged and on the last day of the voting an email to voting ICC members within and/or friendly to the fire alarm and sprinkler industry by the National Fire Sprinkler Association that said in regard to this measure and 3 others, in part; "A (supporting/opposing) vote on this motion will assist an alliance organization, the American Fire Alarm Association, who in the past has supported the fire sprinkler industry". This seems like an admission that some in these industries use the code updating process to create forced markets for their products and services.

- It should also be noted that this same proponent has a similar proposal in progress working it's way through the separate NFPA updating process for the next proposed edition of NFPA 101. APPA's ASCC does have a recently established Work Group to monitor and report on actions within NFPA including NFPA 101, but this Group is only recently formed, and therefore is not as on top of current change proposals as the ICC Work Group is. And while the opportunity for offering public comment on NFPA 101 regarding mass notification systems has passed, APPA is still trying to work the issue.
Proposed Change as Submitted

2015 International Fire Code

Add new text as follows:

1103.5.1 Group A-2. Where alcoholic beverages are consumed in a Group A-2 occupancy having an occupant load of 300 or more, the fire area containing the Group A-2 occupancy shall be equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.

TABLE 1103.1
OCCUPANCY AND USE REQUIREMENTS

<table>
<thead>
<tr>
<th>SECTION</th>
<th>USE</th>
<th>OCCUPANCY CLASSIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High-rise</td>
<td>Atrium or covered mall</td>
</tr>
<tr>
<td>1103.2</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>1103.3</td>
<td>R</td>
<td>—</td>
</tr>
<tr>
<td>1103.4.1</td>
<td>R</td>
<td>—</td>
</tr>
<tr>
<td>1103.4.2</td>
<td>R</td>
<td>—</td>
</tr>
<tr>
<td>1103.4.3</td>
<td>R</td>
<td>—</td>
</tr>
<tr>
<td>1103.4.4</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1103.4.5</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1103.4.6</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1103.4.7</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1103.4.8</td>
<td>R</td>
<td>—</td>
</tr>
<tr>
<td>1103.4.9</td>
<td>R</td>
<td>—</td>
</tr>
</tbody>
</table>

a. Existing buildings shall comply with the sections identified as “Required” (R) based on occupancy classification or use, or both, whichever is applicable.
b. Only applies to Group I-2 Condition 2 as established by the adopting ordinance.
c. Only applies to Group A-2 occupancies where alcoholic beverages are consumed.

R = The building is required to comply.
<table>
<thead>
<tr>
<th>SECTION</th>
<th>SUBJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>914.2.1</td>
<td>Covered and open mall buildings</td>
</tr>
<tr>
<td>914.3.1</td>
<td>High-rise buildings</td>
</tr>
<tr>
<td>914.4.1</td>
<td>Atriums</td>
</tr>
<tr>
<td>914.5.1</td>
<td>Underground structures</td>
</tr>
<tr>
<td>914.6.1</td>
<td>Stages</td>
</tr>
<tr>
<td>914.7.1</td>
<td>Special amusement buildings</td>
</tr>
<tr>
<td>914.8.2</td>
<td>Airport traffic control towers</td>
</tr>
<tr>
<td>914.8.3, 914.8.6</td>
<td>Aircraft hangars</td>
</tr>
<tr>
<td>914.9</td>
<td>Flammable finishes</td>
</tr>
<tr>
<td>914.10</td>
<td>Drying rooms</td>
</tr>
<tr>
<td>914.11.1</td>
<td>Ambulatory care facilities</td>
</tr>
<tr>
<td>1029.6.2</td>
<td>Smoke-protected assembly seating</td>
</tr>
<tr>
<td>1103.5.2</td>
<td>Pyroxylin plastic storage in existing buildings</td>
</tr>
<tr>
<td>1103.5.1</td>
<td>Existing Group A-2 occupancies</td>
</tr>
<tr>
<td>1103.5.3</td>
<td>Existing Group I-2 occupancies</td>
</tr>
<tr>
<td>1103.5.4</td>
<td>Existing Group I-2 Condition 2 occupancies</td>
</tr>
<tr>
<td>1103.5.4</td>
<td>Pyroxylin plastics</td>
</tr>
<tr>
<td>2108.2</td>
<td>Dry cleaning plants</td>
</tr>
<tr>
<td>2108.3</td>
<td>Dry cleaning machines</td>
</tr>
<tr>
<td>2309.3.2.6.2</td>
<td>Hydrogen motor fuel-dispensing area canopies</td>
</tr>
<tr>
<td>2404.2</td>
<td>Spray finishing in Group A, E, I or R</td>
</tr>
<tr>
<td>2404.4</td>
<td>Spray booths and spray rooms</td>
</tr>
<tr>
<td>2405.2</td>
<td>Dip-tank rooms in Group A, I or R</td>
</tr>
<tr>
<td>2405.4.1</td>
<td>Dip tanks</td>
</tr>
<tr>
<td>2405.9.4</td>
<td>Hardening and tempering tanks</td>
</tr>
<tr>
<td>2703.10</td>
<td>HPM facilities</td>
</tr>
<tr>
<td>2703.10.1.1</td>
<td>HPM work station exhaust</td>
</tr>
<tr>
<td>2703.10.2</td>
<td>HPM gas cabinets and exhausted enclosures</td>
</tr>
<tr>
<td>2703.10.3</td>
<td>HPM exit access corridor</td>
</tr>
<tr>
<td>2703.10.4</td>
<td>HPM exhaust ducts</td>
</tr>
<tr>
<td>2703.10.4.1</td>
<td>HPM noncombustible ducts</td>
</tr>
<tr>
<td>2703.10.4.2</td>
<td>HPM combustible ducts</td>
</tr>
<tr>
<td>2807.3</td>
<td>Lumber production conveyor enclosures</td>
</tr>
<tr>
<td>2808.7</td>
<td>Recycling facility conveyor enclosures</td>
</tr>
<tr>
<td>3006.1</td>
<td>Class A and B ovens</td>
</tr>
<tr>
<td>3006.2</td>
<td>Class C and D ovens</td>
</tr>
<tr>
<td>Table 3206.2</td>
<td>Storage fire protection</td>
</tr>
<tr>
<td>3206.4</td>
<td>Storage</td>
</tr>
<tr>
<td>5003.8.4.1</td>
<td>Gas rooms</td>
</tr>
<tr>
<td>5003.8.5.3</td>
<td>Exhausted enclosures</td>
</tr>
<tr>
<td>5004.5</td>
<td>Indoor storage of hazardous materials</td>
</tr>
<tr>
<td>5005.1.8</td>
<td>Indoor dispensing of hazardous materials</td>
</tr>
<tr>
<td>5104.4.1</td>
<td>Aerosol warehouses</td>
</tr>
</tbody>
</table>

For SI: 1 cubic foot = 0.023 m³.

**Reason:** This requirement implements the Recommendation #1 included in the NIST Report of the Technical Investigation of The Station Nightclub Fire (NIST NCSTAR 2: Vol. I). Recommendation 1 of the NIST report states: "Model codes should require sprinkler systems for all new and existing nightclubs regardless of size."

Group A-2 occupancies involve conditions such as large occupant loads, high occupant density, significant fuel loading and moveable furnishings and decorations. Group A-2 occupancies also include the potential for reduced lighting levels, high noise levels, combustible decorations, strobe and flashing lights, alcohol consumption, and confusing egress paths. Each of these alone can be a significant issue, but when combined they lead to the inability of the occupants to promptly and safely exit the building under fire conditions.
This proposal does not reach as far as the recommendation from NIST. While the NIST proposal recommends fire sprinklers in ALL facilities, the proposed section requires the Group A-2 occupancy fire area where alcoholic drinks are consumed in excess of 300 occupants be provided with a fire sprinkler system. The section does not require the other fire areas that may be in the A-2 to be protected, nor does it require the entire floor to be protected. Setting the threshold at 300 occupants will place the requirement where the higher potential for loss of life exists.

The sprinkler retrofit requirement has been targeted to only apply to Group A-2 occupancies that serve alcoholic beverages. This is felt to be more in line with the NIST recommendations that were made following the Station Nightclub fire recognizing that intoxication of patrons plays a significant role in the potential risk of injury or loss of life in the event of a fire. In addition, limiting the scope of the change to only those occupancies where alcoholic beverages are consumed, allows a connection to licensing laws that jurisdictions typically have in place for sale of such beverages. Such licensing laws, where they apply, will provide significant leverage for jurisdictions to be able to effectively enforce the requirement for a fire sprinkler system as a condition of being code compliant and issuance of a license.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Cost Impact: Will increase the cost of construction
Adding a fire sprinkler system in an existing A-2 occupancy that serves alcohol will change the business plan of the owner. Investing into a fire sprinkler system in the long term will benefit the owner by protecting the investment, property, and life safety of the patrons, as well as reduce the liability to the owner and insurance premiums.

Committee Action: Approved as Submitted

Committee Reason: The committee approved this proposal based upon previous action in the 2013 cycle and the fact that they provided a more reasonable threshold of 300 versus that required for new construction of 100.

Assembly Action: None

Individual Consideration Agenda

Proponent: Thomas Daly, The Hospitality Security Consulting Group, LLC, representing American Hotel & Lodging Association (tom.daly@thehscg.com) requests Disapprove.

Commenter's Reason: The Fire Code Committee's action approving this code change proposal fails to differentiate the sprinkler requirement for A-2 Assembly Occupancies that are one story v. multiple story and without regard to the number and location of means of egress. The proposal is not supported by the fire record of single story occupancies with multiple means of egress and all other applicable code complying equipment, system, emergency plans and staff training per the IFC. The proposal does not provide support as to why 300 is a more reasonable threshold than 100, nor are detection and alarm system capabilities considered. The requirement would impose significant economic costs on such occupancies likely causing bankruptcy of the operators and/or owner of such facilities.
Proposed Change as Submitted

Proponent: Michael O'Brian, representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code

Revise as follows:

1104.18 Dead-end corridors Dead-ends. Where more than one exit or exit access doorway is required, the exit access shall be arranged such that dead ends do not exceed the limits specified in Table 1104.18. In Group I-2, in smoke compartments containing patient sleeping rooms and treatment rooms, dead end corridors shall be in accordance with Section 1105.5.6.

Exception: A dead-end passageway or corridor shall not be limited in length where the length of the dead-end passageway or corridor is less than 2.5 times the least width of the dead-end passageway or corridor.

### TABLE 1104.18
COMMON PATH, DEAD-END AND TRAVEL DISTANCE LIMITS (by occupancy)

<table>
<thead>
<tr>
<th>OCCUPANCY</th>
<th>COMMON PATH OF EGRESS TRAVEL LIMIT</th>
<th>DEAD-END LIMIT</th>
<th>EXIT ACCESS TRAVEL DISTANCE LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unsprinklered (feet)</td>
<td>Sprinklered (feet)</td>
<td>Unsprinklered (feet)</td>
</tr>
<tr>
<td>Group A</td>
<td>20(^{a})</td>
<td>20(^{a})</td>
<td>20(^{b})</td>
</tr>
<tr>
<td>Group B(^{1})</td>
<td>75(^{d})</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Group E</td>
<td>75</td>
<td>75</td>
<td>20</td>
</tr>
<tr>
<td>Group F-1, S-1(^{d,h})</td>
<td>75(^{d})</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Group F-2, S-2(^{d,h})</td>
<td>75(^{d})</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Group H-1</td>
<td>25</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Group H-2</td>
<td>50</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Group H-3</td>
<td>50</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>Group H-4</td>
<td>75</td>
<td>75</td>
<td>20</td>
</tr>
<tr>
<td>Group H-5</td>
<td>75</td>
<td>75</td>
<td>20</td>
</tr>
<tr>
<td>Group I-1</td>
<td>75</td>
<td>75</td>
<td>20</td>
</tr>
<tr>
<td>Group I-2</td>
<td>Notes (d, e, g)</td>
<td>Notes (d, e, g)</td>
<td>Note (f_e)</td>
</tr>
<tr>
<td>Group I-3</td>
<td>100</td>
<td>100</td>
<td>NR</td>
</tr>
<tr>
<td>Group I-4 (Day care centers)</td>
<td>NR</td>
<td>NR</td>
<td>20</td>
</tr>
<tr>
<td>Group M (Covered or open mall)</td>
<td>75</td>
<td>100</td>
<td>60</td>
</tr>
<tr>
<td>Group M (Mercantile)</td>
<td>75</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Group R-1 (Hotels)</td>
<td>75</td>
<td>75</td>
<td>50</td>
</tr>
<tr>
<td>Group R-2 (Apartments)</td>
<td>75</td>
<td>125</td>
<td>50</td>
</tr>
<tr>
<td>Group R-3 (One and two family)</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Group R-4 (Residential care/assisted living)</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Group U(^{1})</td>
<td>75(^{d})</td>
<td>100</td>
<td>20</td>
</tr>
</tbody>
</table>

NR = No requirements.

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

- **a.** 20 feet for common path serving 50 or more persons; 75 feet for common path serving less than 50 persons.
- **b.** See Section 1029.9.5 for dead-end aisles in Group A occupancies.
- **c.** This dimension is for the total travel distance, assuming incremental portions have fully utilized their allowable maximums. For travel distance within the room, and from the room exit access door to the exit, see the appropriate occupancy chapter.
- **d.** See Section 412.7 of the International Building Code for special requirements on spacing of doors in aircraft hangars.
- **e.** In Group I-2, separation of exit access doors within a care recipient sleeping room, or any suite that includes care recipient sleeping rooms, shall comply with Section 1105.5.7.
- **f.** In Group I-2, in smoke compartments containing care recipient sleeping rooms and treatment rooms, dead-end corridors shall comply with Section 1105.5.6.
In Group I-2 Condition 2, care recipient sleeping rooms, or any suite that includes care recipient sleeping rooms, shall comply with Section 1105.6.

Where a tenant space in Group B, S and U occupancies has an occupant load of not more than 30, the length of a common path of egress travel shall not be more than 100 feet.

Where the building, or portion of the building, is limited to one story and the height from the finished floor to the bottom of the ceiling or roof slab or deck is 24 feet or more, the exit access travel distance is increased to 400 feet.

For covered and open malls, the exit access travel distance is increased to 400 feet.

**Reason:** This proposal intends to clarify the requirements in Table 1104.18 and correlate the table with revisions that have occurred in recent code change cycles. All of the revisions proposed are editorial, there is no change in code requirements or code application. Revisions are as follows:

- In Section 1104.18, the second sentence is deleted. This sentence is not needed since those provisions are already included in Table 1104.18 as Footnote f (which after revisions becomes Footnote e).
- The header row in Table 1104.18 is revised to maintain consistency with the terms used throughout the code of "exit access travel distance" and "common path of egress travel".

The descriptors in the Occupancy column are deleted. These descriptors are unnecessary since they do not provide any limitation on the application of the requirements in table, other than for Group M. Group M (covered and open malls) and Group M (mercantile) have been combined into one row with a single listing as Group M. New Footnote i is added to correlate with IBC Section 402.8 which allows a travel distance of 400 feet in malls and includes the provisions that were in the deleted row.

Footnote a is deleted along with the deletion of the limitation of 20 feet in Group A for common path of egress travel. Table 1006.2.1 allows a common path of egress travel of 75 feet for new Group A occupancies. The limitation of 20 feet is retained as applicable to dead-end aisles and dead-end corridors.

Footnote d (new Footnote c) is relocated from the Occupancy column to the Exit Access Travel Distance column. Since Footnote d only applies to the exit access travel distance in aircraft hangars this is the appropriate location for the footnote. Aircraft hangars can be classified as either Group F-1 or S-1 in accordance with IBC Sections 306.2 and 311.2, so the footnote is not included in the column for Groups F-2 and S-2.

Footnotes e and f (new Footnotes d and e) are revised by deleting "In Group I-2". This is redundant since the footnotes are located in the row which only applies to Group I-2.

Footnote h (new Footnote g) is relocated from the Occupancy column to the Common Path of Egress Travel column. Since Footnote h only applies to common path of egress travel in nonsprinklered Group B, S and U occupancies, this is the appropriate location for the footnote.

New Footnote h is added to correlate with Section 1017.2.2 which allows a travel distance of 400 feet in Group F-1 and S-1 under certain conditions.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

To assist in reviewing this proposal, the table below shows the end result of all the revisions.

<table>
<thead>
<tr>
<th>OCCUPANCY</th>
<th>COMMON PATH OF EGRESS TRAVEL LIMIT</th>
<th>DEAD-END LIMIT</th>
<th>EXIT ACCESS TRAVEL DISTANCE LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unsprinklered (feet)</td>
<td>Sprinklered (feet)</td>
<td>Unsprinklered (feet)</td>
</tr>
<tr>
<td>Group A</td>
<td>75</td>
<td>75</td>
<td>20(^a)</td>
</tr>
<tr>
<td>Group B</td>
<td>75(^g)</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Group E</td>
<td>75</td>
<td>75</td>
<td>20</td>
</tr>
<tr>
<td>Group F-1, S-1</td>
<td>75(^g)</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Group F-2, S-2</td>
<td>75(^g)</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Group H-1</td>
<td>25</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Group H-2</td>
<td>50</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Group H-3</td>
<td>50</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>Group H-4</td>
<td>75</td>
<td>75</td>
<td>20</td>
</tr>
<tr>
<td>Group H-5</td>
<td>75</td>
<td>75</td>
<td>20</td>
</tr>
<tr>
<td>Group I-1</td>
<td>75</td>
<td>75</td>
<td>20</td>
</tr>
<tr>
<td>Group I-2</td>
<td>Notes d, e</td>
<td>Notes d, e</td>
<td>Note e</td>
</tr>
<tr>
<td>Group I-3</td>
<td>100</td>
<td>100</td>
<td>NR</td>
</tr>
<tr>
<td>Group I-4</td>
<td>NR</td>
<td>NR</td>
<td>20</td>
</tr>
<tr>
<td>Group M</td>
<td>75</td>
<td>100</td>
<td>50</td>
</tr>
</tbody>
</table>
NR = No requirements.
For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m².
a. See Section 1029.9.5 for dead-end aisles in Group A occupancies.

- For travel distance within the room, and from the room exit access door to the exit, see the appropriate occupancy chapter.
- Separation of exit access doors within a care recipient sleeping room, or any suite that includes care recipient sleeping rooms, shall comply with Section 1105.5.7.
- In smoke compartments containing care recipient sleeping rooms and treatment rooms, dead-end corridors shall comply with Section 1105.6.
- In Group I-2 Condition 2, care recipient sleeping rooms, or any suite that includes care recipient sleeping rooms, shall comply with Section 1105.6.
- Where a tenant space in Group B, S and U occupancies has an occupant load of not more than 30, the length of a common path of egress travel shall not be more than 100 feet.
- Where the building, or portion of the building, is limited to one story and the height from the finished floor to the bottom of the ceiling or roof slab or deck is 24 feet or more, the exit access travel distance is increased to 400 feet.
- For covered and open malls, the exit access travel distance is increased to 400 feet.

**Cost Impact:** Will not increase the cost of construction
This is clarification of the current code requirements.

**Public Hearing Results**

**Committee Action:** Disapproved

**Committee Reason:** This proposal has merit but there are number of issues that need to be addressed. The main issue is the lack of correlation of terminology with that used in Chapter 10 of the IBC and IFC. The term passageway is not applicable in this particular use. The focus should be on corridors. In addition these requirements need to be correlated with the IEBC. In some cases the IEBC is less restrictive. It is hoped that these issues are addressed and addressed during public comment.

**Assembly Action:** None

**Individual Consideration Agenda**

**Public Comment 1:**

**Proponent:** Michael O'Brian representing Fire Code Action Committee (fcac@icclee.org) requests Approve as Modified by this Public Comment.

**Modify as Follows:**

**2015 International Fire Code**

**1104.18 Dead-ends.** Where more than one exit or exit access doorway is required, the exit access shall be arranged such that dead ends do not exceed the limits specified in Table 1104.18.

**Exception:** A dead-end passageway or corridor shall not be limited in length where the length of the dead-end passageway or corridor is less than 2.5 times the least width of the dead-end passageway or corridor.

**TABLE 1104.18**

COMMON PATH, DEAD-END AND TRAVEL DISTANCE LIMITS (by occupancy)
<table>
<thead>
<tr>
<th>OCCUPANCY</th>
<th>COMMON PATH OF EGRESS TRAVEL LIMIT</th>
<th>DEAD-END LIMIT</th>
<th>EXIT ACCESS TRAVEL DISTANCE LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unsprinklered (feet)</td>
<td>Sprinklered (feet)</td>
<td>Unsprinklered (feet)</td>
</tr>
<tr>
<td>Group A</td>
<td>75</td>
<td>75</td>
<td>20 distribute</td>
</tr>
<tr>
<td>Group B</td>
<td>75 distribute</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Group E</td>
<td>75</td>
<td>75</td>
<td>20</td>
</tr>
<tr>
<td>Group F-1, S-1</td>
<td>75 distribute</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Group F-2, S-2</td>
<td>75 distribute</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Group H-1</td>
<td>25</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Group H-2</td>
<td>50</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Group H-3</td>
<td>50</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>Group H-4</td>
<td>75</td>
<td>75</td>
<td>20</td>
</tr>
<tr>
<td>Group H-5</td>
<td>75</td>
<td>75</td>
<td>20</td>
</tr>
<tr>
<td>Group I-1</td>
<td>75</td>
<td>75</td>
<td>20</td>
</tr>
<tr>
<td>Group I-2</td>
<td>Notes d, e, f</td>
<td>Notes d, e, f</td>
<td>Note e</td>
</tr>
<tr>
<td>Group I-3</td>
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<td>100</td>
<td>NR</td>
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<td>Group I-4</td>
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</tr>
<tr>
<td>Group M</td>
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<td>75</td>
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</tr>
<tr>
<td>Group R-1</td>
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<td>50</td>
</tr>
<tr>
<td>Group R-3</td>
<td>NR</td>
<td>NR</td>
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</tr>
<tr>
<td>Group R-4</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Group U</td>
<td>75 distribute</td>
<td>100</td>
<td>20</td>
</tr>
</tbody>
</table>

NR = No requirements.
For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m$^2$.

a. See Section 1029.9.5 for dead-end aisles in Group A occupancies.
b. This dimension is for the total travel distance, assuming incremental portions have fully utilized their allowable maximums. For travel distance within the room, and from the room exit access door to the exit, see the appropriate occupancy chapter.
c. See Section 412.7 of the *International Building Code* for special requirements on spacing of doors in aircraft hangars.
d. Separation of exit access doors within a care recipient sleeping room, or any suite that includes care recipient sleeping rooms, shall comply with Section 1105.5.7.
e. In smoke compartments containing care recipient sleeping rooms and treatment rooms, dead-end corridors shall comply with Section 1105.5.6.
f. In Group I-2 Condition 2, care recipient sleeping rooms, or any suite that includes care recipient sleeping rooms, shall comply with Section 1105.6.
g. Where a tenant space in Group B, S and U occupancies has an occupant load of not more than 30, the length of a common path of egress travel shall not be more than 100 feet.
h. Where the building, or portion of the building, is limited to one story and the height from the finished floor to the bottom of the ceiling or roof slab or deck is 24 feet or more, the exit access travel distance is increased to 400 feet.
i. For covered and open malls, the exit access travel distance is increased to 400 feet.

**Commenter's Reason:** This Public comment addresses the issues raised in Louisville. The Code Development Committee agreed with concept of the proposal but wanted the terminology to correlate with the current terminology used in IBC/IFC Chapter 10.

Section 1104.18 is revised to remove the reference to passageways. Even though this is existing language in the code, it is appropriate to remove it from this section. The dead-end limitation applies to aisles in Group A and corridors.

Additionally, Footnote f is added to the row for Group I-2 in columns 2 and 3. This is appropriate since this footnote only applies to dead-end corridors in Group I-2.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-ffc)}
Proponent: Steven Orlowski, BOMA International, representing Building Owners and Managers Association International (sorlowski@boma.org); Michael O'Brian (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

1104.18 Dead-ends. Where more than one exit or exit access doorway is required, the exit access shall be arranged such that dead ends do not exceed the limits specified in Table 1104.18.

Exceptions:

1. A dead-end passageway or corridor shall not be limited in length where the length of the dead-end passageway or corridor is less than 2.5 times the least width of the dead-end passageway or corridor.

2. In existing buildings, existing dead-end corridors shall be permitted to comply with lengths established in Section 805.6 of the International Existing Building Code. Any newly constructed dead-end corridors within an existing building shall be limited to the lengths allowed by the International Building Code.

Commenter's Reason: During the Committee Action Hearings, BOMA raised the point that the original proposal failed to take into account that the proposed dead-end corridor lengths allowed in the IEBC. This public comment adds a new exception permitting existing dead-end corridors (which are permitted by the IEBC and may exceed the limitations set forth in the table) to remain, while also adding language that would require any newly created dead-end corridors to meet the lengths for new construction.

F247-16
Proposed Change as Submitted

Proponent: John Williams, CBO, representing Adhoc Healthcare Committee (AHC@iccsafe.org); Carl Baldassarra, P.E., FSFPE, representing Code Technology Committee (CTC@iccsafe.org)

2015 International Fire Code

SECTION 1105 CONSTRUCTION REQUIREMENTS FOR EXISTING GROUP I-2

1105.1 General. Existing Group I-2 shall meet all of the following requirements:

1. The minimum fire safety requirements in Section 1103.
2. The minimum mean of egress requirements in Section 1104.
3. The additional egress and construction requirements in Section 1105.

Where the provisions of this chapter conflict with the construction requirements that applied at the time of construction, the most restrictive provision shall apply.

Add new text as follows:

1105.2 Applicability. The provisions of Section 1105.3 through 1105.8, 1105.10 and 1105.11 shall apply to the existing Group I-2 fire area.

Revise as follows:

1105.8 1105.9 Group I-2 automatic sprinkler system. An automatic sprinkler system installed in accordance with Section 903.3.1.1 shall be provided throughout the floor containing existing the Group I-2 fire area. The sprinkler system shall be provided throughout the floor where the Group I-2 occupancy is located, and in all floors between the Group I-2 occupancy fire area and the level of exit discharge, the level of exit discharge and all floors below the level of exit discharge.

Exception: Floors classified as an open parking garage are not required to be sprinklered.

Reason: This proposal addresses the federal requirement that a separation between I-2 occupancies that comply with the requirements in this section and those that do not. Since a building could be several different occupancies, it is reinforcing the need for separation between portion of the building that is compliant with chapter 11 for Group I-2, and other portions of the buildings. This would require a fire separation between the Group B portion of an existing building that does not comply with all of the minimum retroactive standards of this chapter.

The revision of Section 1105.8 was to be consistent with the language in Section 1103.5.3 requiring retroactive sprinkler systems in Group I-2 division 2 occupancies. The intent is to increase the scope of the minimum sprinkler coverage to below the level of existing discharge. 1103.5.3 require coverage of the building by date certain.

This is a joint proposal submitted by the ICC Ad Hoc Committee on Healthcare (AHC) and the ICC Code Technology Committee (CTC). The AHC was established by the ICC Board to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHEN), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2014 and 2015 the ICC Ad Hoc Committee has held 4 open meetings and numerous Work Group meetings and conference calls for the current code development cycle which included members of the committees as well as any interested party to discuss and debate the proposed changes. Information on the AHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the AHC effort can be downloaded from the AHC website at: AHC (http://www.iccsafe.org/cs/AHC/Pages/default.aspx). The two remaining CTC Areas of Study are Care Facilities and Elevator Lobbies/WTC Elevator issues. This proposal falls under the Care Facilities Area of Study. In 2014 and 2015 ICC CTC Committee has held 4 open meetings and numerous Work Group meetings and conference calls for the current code development cycle which included members of the committees as well as any interested party to discuss and debate the proposed changes. Information on the CTC, including: the sunset plan; meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the CTC website CTC (http://www.iccsafe.org/cs/CTC/Pages/default.aspx).

Cost Impact: Will increase the cost of construction

The required separation is already a federal requirement. Retroactive sprinklering below the level of exit discharge is already required for nursing homes, per federal regulation. Sprinklering below the LED will be an impact for those hospitals that did not do this today.
Committee Action: Disapproved

Committee Reason: The proposal was disapproved based upon concerns with how parking garages are addressed in the exception. In particular if a building or portion thereof is required to be equipped with a sprinkler system throughout there was concern how this exception would work with that concept.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: John Williams, CBO, representing Adhoc Healthcare Committee (AHC@iccsafe.org) requests Approve as Modified by this Public Comment.

Further Modify as Follows:

2015 International Fire Code

1105.9 Group I-2 automatic sprinkler system. An automatic sprinkler system installed in accordance with Section 903.3.1.1 shall be provided throughout the floor containing existing the Group I-2 fire area. The sprinkler system shall be provided throughout the floor where the Group I-2 occupancy is located, and in all floors between the Group I-2 occupancy fire area and the nearest level of exit discharge, the level of exit discharge and all floors below the level of exit discharge.

Exception: Floors classified as an open parking garage are not required to be sprinklered.

Commenter's Reason: The committee stated that the proposal was disapproved based upon concerns with how parking garages are addressed in the exception. In particular if a building or portion thereof is required to be equipped with a sprinkler system throughout there was concern how this exception would work with that concept. Section 1105 is applicable to Group I-2 facilities that are so old that they are not fully sprinklered. This requirement would not be applicable to facilities that are new construction or a change of occupancy. In addition, there are many examples of where open parking garages are not required to be sprinklered in new construction. The fire hazard in open parking garages is so limited that it does not warrant a requirement to retroactively add sprinklers at this time.

The modification is intended to remove superfluous language.
Proposed Change as Submitted

Proponent: Tony Crimi, International Firestop Council, representing International Firestop Council (tcrimi@sympatico.ca)

2015 International Fire Code

Delete and substitute as follows:

1105.4.2 Fire-resistance rating. Unless required elsewhere in this code, corridor walls are not required to have a fire-resistance rating.

Corridor walls that were installed as fire-resistance rated assemblies in accordance with the applicable codes under which the building was constructed, remodeled, or altered shall be maintained.

Exception: Where approved by the code official, in buildings sprinklered in accordance with Section 903.3.1.1 of the
International Building Code, the required fire resistance ratings of corridor walls shall be permitted to meet the requirements of the current building code. The building is also required to meet the other applicable requirements of the International Building Code. Plans, investigation and evaluation reports, and other data shall be submitted indicating which building elements and materials the applicant is requesting the code official to review and approve for determination of applying the current building code fire-resistance ratings. Any special construction features, including fire-resistance-rated assemblies and smoke-resistive assemblies, conditions of occupancy, means-of-egress conditions, fire code deficiencies, approved modifications or approved alternative materials, design and methods of construction, and equipment applying to the building that impact required fire-resistance ratings shall be identified in the evaluation reports submitted.

Reason: The existing language is problematic, in that this language assumes that the Group I-2 fire area is sprinklered, and therefore seeks to take advantage of sprinkler tradeoffs in the IBC, but does not mandate the installation of automatic sprinklers, nor mandate that the building was originally designed as a sprinklered building. It is also problematic in that the statement “Where permitted elsewhere in this code ..” requires the Fire Code official and Building Owner to research the entire IFC to look for situations where this exception might be prohibited. This proposal modifies the section to tell users of the IFC what is required, what is permitted, and when. This clarity should aid both compliance and enforcement.

This proposal uses the same approach that was approved in Section 803.6 of the International Existing Building Code during the previous code development cycle, via code change EB26-13. The concept is that once a building without sprinkler protection has been sprinklered throughout, whether due to renovations or retroactive code application, the designer should be permitted to take advantage of some of the sprinkler trade-offs that are allowed for new construction, such as the allowance for healthcare corridors to be smoke partitions instead of needing to be fire partitions. Corridors in I-2 occupancies were required to be fire partitions for decades in non-sprinklered hospitals, and also in sprinklered hospitals built to one of the legacy codes.

The issue that this code article needs to properly and accurately address is how to provide for that application of code and ensure a proper review by the building code official is performed to ensure there are no impediments to granting an approval that may result in the reduction of existing levels of protection to below the level of safety provided by the current building code.

This proposal attempts to provide a mechanism for that process by adding a new section to the IFC which is adapted, essentially verbatim, from Section 803.6 of the IEBC. The suggested language provides that once an existing building is sprinklered throughout and meets the other fire protection requirements of the IBC, plans, investigation and evaluation reports, and other data can be submitted seeking approval of the code official for the re-assignment of the original fire-resistance rating for corridors down to zero (i.e. smoke resistance only).

It should be noted that, according to the NFPA “Report on Fires in Health Care Facilities” published November 2012, between 2006 and 2010, Sprinklers were present in only 55% of reported health care fires. Although those statistics for fires 5-10 years ago may not precisely gauge the exact proportion of healthcare facilities without sprinklers today, the fact remains that a substantial number of existing I-2 occupancies are not sprinklered throughout. Revising this code article to lay out a clear path for reducing the required fire resistance rating of corridors can only assist in incentivizing older hospitals to have sprinklers retrofitted as soon as possible.

For reference, the language in 2015 IEBC is provided as follows:

“803.6 Fire-resistance ratings. Where approved by the code official, buildings where an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 of the International Building Code has been added, and the building is now sprinklered throughout, the required fire resistance ratings of building elements and materials shall be permitted to meet the requirements of the current building code. The building is required to meet the other applicable requirements of the International Building Code.

Plans, investigation and evaluation reports, and other data shall be submitted indicating which building elements and materials the applicant is requesting the code official to review and approve for determination of applying the current building code fire-resistance ratings. Any special construction features, including fire-resistance-rated assemblies and smoke-resistive assemblies, conditions of occupancy, means-of-egress conditions, fire code deficiencies, approved modifications or approved alternative materials, design and methods of construction, and equipment applying to the building that impact required fire-
Committee Action: Disapproved

Assembly Action: None

F251-16:
1105.4.2-
CRIMI13123

Public Hearing Results

Committee Reason: Although the exception comes from the IEBC the exception was felt to be too complex. In addition, Section 1103.1 exception 1 already addresses this allowance in the IEBC and the language does not need to be duplicated in the IFC.

Public Comment 1:

Proponent: Tony Crimi, representing International Firestop Council (tcrimi@sympatico.ca); John Williams, CBO, representing Adhoc Health Care Committee (AHC@iccsafe.org) requests Approve as Modified by this Public Comment.

Replace Proposal as Follows:

2015 International Fire Code

1105.4.2 Fire-resistance rating. Unless required elsewhere in this code, corridor walls are not required to have a fire-resistance rating. Corridor walls that were installed as fire-resistance rated assemblies in accordance with the applicable codes under which the building was constructed, remodeled, or altered shall be maintained unless modified in accordance with the International Existing Building Code.

Commenter’s Reason:

CRIMI: IFC 1105 is titled “Fire Resistance Ratings”. IFC 1105.1 already states that “Where the provisions of this chapter conflict with the construction requirements that applied at the time of construction, the most restrictive provision shall apply.” 1105.4.2 currently states that unless required elsewhere in the IFC, corridor walls are not required to have a fire-resistance rating. In some jurisdictions, legacy codes did require corridor walls to have a fire resistance rating for these occupancies. IFC 1103.1 already requires that existing buildings comply with not less than the minimum provisions specified in Table 1103.1. It also requires that the provisions of this chapter cannot be construed to allow the elimination of fire protection systems or a reduction. The statement in 1105.4.2, as currently written, is either redundant, or misleading. In either case, it requires clarification.

This proposed revision clarifies the existing situation, and provides guidance to code users and code officials by referring to the requirements that were added to section 803.6 of the 2015 edition of the IEBC by EB26-13.

WILLIAMS: This proposed language adds clarity to the code and simplifies the original proposal. In new construction, with sprinkler systems, corridors in hospitals and nursing homes are not required to be rated. This provides direction for code officials and fire officials as what to do in hospitals that have added sprinkler systems and have existing corridor walls and openings that resist the passage of smoke or are fire-resistance rated. There has been confusion on if those corridor walls are required to be maintained. This also provides a link back to the IEBC in case a facility wants to make revisions to existing rated corridor walls. Facilities have to have a discussion with the code official if they want to make a change.
Committee Action: Approved as Modified

F252-16
IFC: 1105.4.3.

Proposed Change as Submitted

Proponent: Tony Crimi, International Firestop Council (tcrimi@sympatico.ca)

2015 International Fire Code
Revise as follows:

1105.4.3 Corridor wall continuity. Corridor walls maintained as smoke partitions shall extend from the top of the foundation or floor below to one of the following:

1. The underside of the floor or roof sheathing, deck or slab above.
2. The underside of a ceiling above where the ceiling membrane is constructed to limit the passage of smoke.
3. The underside of a lay-in ceiling system where the ceiling system is constructed to limit the passage of smoke and where the ceiling tiles weigh not less than 1 pound per square foot (4.88 kg/m²) of tile.

Reason: The language of this section clearly describes the criteria and requirements for smoke partitions. This condition would be appropriate where Group I-2 hospitals are sprinklered. However, the language in this new section (added to 2015 code) would also incorrectly apply to non-sprinklered Group I-2, even where corridor walls have been constructed as fire partitions, smoke barriers or fire barriers, and would be required as part of a building's overall fire safety design.

According to the NFPA "Report on Fires in Health Care Facilities" published November 2012, between 2006 and 2010, sprinklers were present in only 55% of reported health care fires. Although those statistics for fires 5-10 years ago may not precisely gauge the exact proportion of healthcare facilities without sprinklers today, the fact remains that many existing I-2 occupancies are not sprinklered.

The practice of constructing corridor walls in Group I-2 hospitals as fire partitions existed for many years in the legacy codes, as a means of providing safe harbor for patients. The corridor walls may still be required to be maintained as fire partitions, based on other conditions present (sprinklers, conformance of other fire safety features to the current building code). The continuity requirements of 1105.4.3, as added to the 2015 IFC, would void the fire resistance provided by an existing and required fire partition. Additionally, a corridor wall might also serve as part of a required smoke barrier (1-hr rated construction) or as a fire barrier providing incidental use separation. It is incorrect to state that the continuity of any and all corridor walls should therefore be to extend only to a ceiling that limits the passage of smoke. Some corridor walls will need to have the continuity required of the assembly that it is designed to be (smoke barrier, fire partition, fire barrier).

Compartmentation using construction to contain fire risks protect patients in place reduces the need for relocation or evacuation and allows for a continuation of medical care. This level of protection cannot be permitted to be removed without additional measures being employed, or without investigation, evaluation reports, and other data indicating approved modifications or approved alternative materials, design and methods of construction, and equipment applying to the building that impact required fire-resistance ratings shall be identified in the evaluation reports submitted.


Cost Impact: Will not increase the cost of construction
Applies only to corridor walls maintained as smoke partitions. Other assembly types are governed elsewhere in the IFC.

Public Hearing Results

Modification:

1105.4.3 Corridor wall continuity. Corridor walls not required to be maintained as smoke partitions in accordance with 703.1.2 or 703.1.3 shall extend from the top of the foundation or floor below to one of the following:

1. The underside of the floor or roof sheathing, deck or slab above.
2. The underside of a ceiling above where the ceiling membrane is constructed to limit the passage of smoke.
3. The underside of a lay-in ceiling system where the ceiling system is constructed to limit the passage of smoke and where the ceiling tiles weigh not less than 1 pound per square foot (4.88 kg/m²) of tile.
Committee Reason: This proposal was approved based upon the addition of the modification which focuses more specifically on walls that are not smoke rated or fire rated. This was the original intent that needed to be clarified. The modification makes this more clear by excluding those walls already regulated by Section 703.1.2 or 703.1.3.

Assembly Action: None

Individual Consideration Agenda

Proponent: Michael O'Brian representing Fire Code Action Committee (fcac@iccsafe.org) requests Disapprove.

Commenter's Reason: The original proposal, along with the Approved as Modified version, needs to be Disapproved.

The application of IFC Chapter 11 is to provide the minimum acceptable level of protection in existing buildings. IFC Section 1101.2 provides the intent for Chapter 11 as follows:

The intent of this chapter is to provide a minimum degree of fire and life safety to persons occupying existing buildings by providing minimum construction requirements where such existing buildings do not comply with the minimum requirements of the IBC.

Additionally, IFC Section 1105.1 states:

Where the provisions of this chapter conflict with the construction requirements that applied at the time of construction, the most restrictive provision shall apply.

The application of Section 1105.4.3 is to require that all corridor walls meet these minimum requirements. In newer buildings, where the walls are constructed as fire partitions, those requirements will exceed the requirements in Section 1105.4.3. Where that occurs, Section 1105.1 states that the more restrictive applies which would require maintaining the wall as a fire partition.

Adding this language into this section, only complicates the section forcing the user to refer back to Chapter 7. Where in actuality, the walls must meet these requirements regardless of whether they must comply with Sections 703.1.2 or 703.1.3.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

F252-16
Proposed Change as Submitted

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com)

2015 International Fire Code

SECTION 2201 GENERAL

Revise as follows:

2201.1 Scope. The equipment, processes and operations involving dust explosion hazards shall comply with the provisions of this chapter code and NFPA 652.

2201.2 Permits. Permits shall be required for combustible dust-producing operations as set forth in Section 105.6.

SECTION 2203 PRECAUTIONS

Add new text as follows:

2203.1 **Owner responsibility.** The owner or operator of a facility with operations that manufacture, process, blend, convey, repackage, generate or handle potentially combustible dusts or combustible particulate solids shall be responsible for compliance with the provisions of this code and NFPA 652.

2203.2 **Dust hazard analysis (DHA).** The requirements of NFPA 652 apply to all new and existing facilities and operations with potentially combustible dust. Existing facilities shall have a Dust Hazards Analysis (DHA) completed in accordance with Section 7.1.2 of NFPA 652.

The fire code official shall order a dust hazard analysis to occur sooner if a combustible dust hazard has been identified in a facility that has not previously performed an analysis.

Revise as follows:

2203.3 **Sources of ignition.** No change to text.

2203.4 **Housekeeping.** No change to text.

SECTION 2204 EXPLOSION PROTECTION ADDITIONAL REQUIREMENTS

2204.1 **Standards Specific hazards standards.** The fire code official is authorized to enforce applicable provisions of the industry- or commodity-specific codes and standards listed in Table 2204.1 to prevent shall be complied with based upon the identification and control dust explosions evaluation of the specific fire and deflagration hazards that potentially exist at a facility.

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>SUBJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFPA 61</td>
<td>Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities</td>
</tr>
<tr>
<td>NFPA 69</td>
<td>Standard on Explosion Prevention Systems</td>
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<td>NFPA 70</td>
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<tr>
<td>NFPA 85</td>
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<tr>
<td>NFPA 120</td>
<td>Standard for Fire Prevention and Control in Coal Mines</td>
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<td>NFPA 484</td>
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<tr>
<td>NFPA 654</td>
<td>Standard for Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids</td>
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<tr>
<td>NFPA 655</td>
<td>Standard for the Prevention of Sulfur Fires and Explosions</td>
</tr>
<tr>
<td>NFPA 664</td>
<td>Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities</td>
</tr>
</tbody>
</table>

2015 International Building Code

CHAPTER 4 SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

SECTION [F] 426 COMBUSTIBLE DUSTS, GRAIN PROCESSING AND STORAGE

426.1 **Combustible dusts, grain processing and storage.** The provisions of Sections 426.1.1 through 426.1.7 shall apply to buildings in which materials that produce combustible dusts are stored or handled. Buildings that store or handle combustible dusts shall comply with NFPA 652 and the applicable provisions of NFPA 61, NFPA 85, NFPA 120, NFPA 484, NFPA 654, NFPA
Committee Action: Approved as Submitted

Committee Reason: The proposal was approved as a reference to the new NFPA standard 652 is necessary. This reference will provide more information on determining dust hazards and coordination with NFPA is important. There were some concerns about how this new standard would work with the more industry standards. For instance NFPA 664 is better for wood than potentially a more general reference to NFPA 652.

Assembly Action: None

Public Hearing Results

Public Comment 1:

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com); Gregory Keith (grkeith@mac.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

2203.2 Dust hazard analysis (DHA). The requirements of NFPA 652 apply to all new and existing facilities and operations with potentially a combustible dust hazard. Existing facilities shall have a Dust Hazards Analysis (DHA) completed in accordance with Section 7.1.2 of NFPA 652.

The fire code official shall be authorized to order a dust hazard analysis to occur sooner if a combustible dust hazard has been identified in a facility that has not previously performed an analysis.

2204.1 Specific hazards standards. The the industry- or commodity-specific codes and standards listed in Table 2204.1 shall be complied with based upon the identification and evaluation of the specific fire and deflagration hazards that potentially exist at a facility.

Commenter's Reason: The purpose of this public comment is to clarify application of the new requirements. The word "potentially" has been struck from Section 2203.2 and new language added to clarify that it is a combustible dust "hazard" that is the target of the language. You could have combustible dust present without being a hazard, such as in bags in a storage facility. The wording "be authorized to" has been added after the word "shall" in the second paragraph of Section 2203.2 to clarify that the intent is to give the fire code authority to act, not to command the fire code official to act. The word "potentially" is struck from Section 2204.1. These referenced standards are applied after the combustible dust hazard has been confirmed.
Proponent: Veronica Tinney, U.S. Chemical Safety and Hazard Investigation Board, representing US Chemical Safety Board (veronica.tinney@csb.gov) requests Approve as Submitted.

Commenter's Reason: The U.S. Chemical Safety and Hazard Investigation Board (CSB) made the following recommendation to the International Code Council (ICC) as a result of the CSB's Hoeganaes Corporation investigation. The full report is available at: http://www.csb.gov/hoeganaes-corporation-fatal-flash-fires/.

CSB Recommendation No. 2011-4-I-TN-R4: Revise IFC Chapter 22 Combustible Dust Producing Operations; Section 2204.1 Standards, to require mandatory compliance and enforcement with the detailed requirements of the NFPA standards cited in the chapter, including NFPA 484.

Proposal F258-16, submitted by Robert Davidson, accomplishes the intent of the CSB's recommendation by stating that the codes and standards in Table 2204.1, of which NFPA 484 is included, shall be complied with based upon the identification and evaluation of specific fire and deflagration hazards from combustible dusts that could potentially exist at a facility. As Mr. Davidson's proposal would accomplish the intent of the CSB's recommendation, the CSB supports proposal F258-16 as a change to the next edition of the IFC.

Committee Action: Disapproved

Committee Reason: This proposal was disapproved as it was unclear why dispensers needed to be added to the list of approved equipment. Also there were questions about the standard associated with this requirement.

Assembly Action: None
Individual Consideration Agenda

Public Comment 1:

Proponent: Bruce Swiecicki, National Propane Gas Association, representing National Propane Gas Association (bswiecicki@npga.org) requests Approve as Modified by this Public Comment.

Replace Proposal as Follows:

2015 International Fire Code

2307.2 Approvals. Storage vessels and equipment used for the storage or dispensing of LP-gas shall be approved or listed in accordance with Sections 2307.2.1 and 2307.2.2.

2307.2.1 Approved equipment. Containers, dispensers, pressure relief devices (including pressure relief valves), pressure regulators and piping for LP-gas shall be approved.

2307.2.2 Listed equipment. Hoses, hose connections, vehicle fuel connections, dispensers installed at service stations, LP-gas pumps and electrical equipment used for LP-gas shall be listed.

Commenter's Reason: LP-Gas dispensers installed at service stations which are open to the public are listed to UL 495 "Power Operated Dispensing Devices for LP-Gas." The scope of this standard does not include dispensing devices that are installed at LP-gas bulk plants (used to fill forklift cylinders and fleet vehicles) and other private fleet vehicle fueling installations. The scope of UL 495 reads as follows:

1.1 These requirements cover power-operated dispensing devices intended to be installed outside of buildings and used at service stations for dispensing liquefied petroleum gas used as an engine fuel.

Approval of this public comment will correlate the text of the IFC with the scope of the listing standard to ensure that all LP-gas dispensers installed at service stations are listed units, while recognizing that dispensers installed and used at LP-gas bulk plants and private facilities are not within the scope of tUL 495 and therefore must be approved in accordance with 2307.2.1.

F269-16
Proposed Change as Submitted

Proponent: Dan Bowerson, NGVAmerica, representing NGVAmerica Technology & Development Committee (dbowerson@ngvamerica.org)

2015 International Fire Code

Revise as follows:

2311.7 Repair garages for vehicles fueled by lighter-than-air fuels. Repair garages for the conversion and repair of vehicles that use CNG, liquefied natural gas (LNG), hydrogen or other lighter-than-air motor fuels shall be in accordance with Sections 2311.7 through 2311.7.2.3 in addition to the other requirements of Section 2311.

Exceptions:

1. Repair garages where work is conducted only on vehicles that have been defueled and their systems purged with nitrogen gas, and where standard operating procedures to document and maintain the fueling status throughout repair operations are approved.

2. Repair garages where work is not performed on the fuel system and is limited to exchange of parts and maintenance not requiring open flame or welding on the CNG-, LNG-, hydrogen- or other lighter-than-air-fueled motor vehicle.

3. Repair garages for hydrogen-fueled vehicles where work is not performed on the hydrogen storage tank and is limited to the exchange of parts and maintenance not requiring open flame or welding on the hydrogen-fueled vehicle. During the work, the entire hydrogen fuel system shall contain a quantity that is less than 200 cubic feet (5.6 m³) of hydrogen.

Reason: Based on the findings of the SANDIA Report (SAND2014-2342), the credible natural gas releases during LNG and CNG vehicle maintenance operations are limited to about 128,700 BTUs of fuel over a very short time frame. The released natural gas dissipates quickly and is typically ignitable from the point of release to no more than eight feet from that point. These releases do not create an ignitable mixture at the ceiling of the facility due to rapid dispersion of the gas; and ventilation above the normal ventilation rates of a typical repair has little or no impact on the dispersion. There has not been any reported release of a full CNG cylinder due to any maintenance operation in the last 35 years of record keeping. In the 1990’s there were full cylinder releases due to faulty temperature activated pressure relief devices (TPRDs), but they have been eliminated from the population and were not related to maintenance operations.

Additional information:

CNG, or gas phase LNG, released due to maintenance on the fuel lines and associated equipment without proper defueling and purging of those systems: It is estimated that less than 150 cu.ft. of natural gas is released at varying pressures based on the specific fuel system. Mitigation of the hazard associated with these releases is covered in the SANDIA Report, SAND2014-2342, which indicates the hazardous areas (extent of ignitable mixtures) and time to dispersion of released gas. The proposed code change to 2311.7.1 will no longer require any increased ventilation to disperse natural gas from these releases since the SANDIA report shows that ventilation has little or no impact on these small, short term hazards.


Cost Impact: Will not increase the cost of construction

This proposal will reduce the cost of operation. Because the vehicle will be defueled prior to entering the maintenance facility, the facility will not need to be updated for work on vehicles fueled by lighter-than-air fuels.
Individual Consideration Agenda

Public Comment 1:

Proponent: Dan Bowerson, representing NGV America Technology & Development Committee (dbowerson@ngvamerica.org); Ted Williams, representing American Gas Association (twilliams@aga.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

2311.7 Repair garages for vehicles fueled by lighter-than-air fuels. Repair garages for the conversion and repair of vehicles that use CNG, liquefied natural gas (LNG), hydrogen or other lighter-than-air motor fuels shall be in accordance with Sections 2311.7 through 2311.7.2.3 in addition to the other requirements of Section 2311.

Exceptions:

1. Repair garages where work is conducted only on vehicles that have been defueled and their systems purged with nitrogen gas, and where standard operating procedures to document and maintain the fueling status throughout repair operations are approved.
2. Repair garages where work is not performed on the fuel system and is limited to exchange of parts and maintenance not requiring open flame or welding on the CNG-, LNG-, hydrogen- or other lighter-than-air-fueled motor vehicle.
3. Repair garages for hydrogen-fueled vehicles where work is not performed on the hydrogen storage tank and is limited to the exchange of parts and maintenance not requiring open flame or welding on the hydrogen-fueled vehicle. During the work, the entire hydrogen fuel system shall contain a quantity that is less than 200 cubic feet (5.6 m³) of hydrogen.
4. Repair garages for natural gas fueled vehicles where work is not being performed on the fuel storage tank, and is limited to the exchange of parts and maintenance not requiring open flame or welding on the natural gas fueled vehicle. During the work, the natural gas in the vehicle fuel tank shall contain a pressure of not more than 250 psi at 70°F.

Commenter’s Reason:

BOWERSON: This proposal was submitted as Floor Modification, F273-16 Bowerson 2, but was not heard by committee. The last exception would allow natural gas vehicles in the facility with limited amount of fuel (enough to drive the vehicle in/out of the facility), so long as work is not being done on the storage tank, it is limited to the exchange of parts, and there is no open flame or welding on the natural gas vehicle.

Based on the findings of the SANDIA Report (SAND2014-2342), the credible natural gas releases during LNG and CNG vehicle maintenance operations are limited to about 128,700 BTUs of fuel over a very short time frame. The released natural gas dissipates quickly and is typically ignitable from the point of release to no more than eight feet from that point. These releases do not create an ignitable mixture at the ceiling of the facility due to rapid dispersion of the gas; and ventilation above the normal ventilation rates of a typical repair has little or no impact on the dispersion. There has not been any reported release of a full CNG cylinder due to any maintenance operation in the last 35 years of record keeping. In the 1990’s there were full cylinder releases due to faulty temperature activated pressure relief devices (TPRDs), but they have been eliminated from the population and were not related to maintenance operations.

Additional information:

CNG, or gas phase LNG, released due to maintenance on the fuel lines and associated equipment without proper defueling and purging of those systems: It is estimated that less than 150 cu.ft. of natural gas is released at varying pressures based on the specific fuel system. Mitigation of the hazard associated with these releases is covered in the SANDIA Report, SAND2014-2342, which indicates the hazardous areas (extent of ignitable mixtures) and time to dispersion of released gas. The proposed code change to 2311.7.1 will no longer require any increased ventilation to disperse natural gas from these releases since the SANDIA report shows that ventilation has little or no impact on these small, short term hazards.

WILLIAMS: The additional exception allows exception from Sections 2311.7 through 2311.7.2.3 in addition to the other requirements of Section 2311 for maintenance activities on natural gas vehicles without overly restricting maintenance operations or requiring defueling as the approved proposal had provided. Hazards are controlled by limiting the list of maintenance activities that might serve as potential ignition sources and limiting natural gas fuel volumes and pressures.
Proposed Change as Submitted

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Quong & Associates, Inc./Toyota (rjd@davidsoncodeconcepts.com); Martin Gresho (marty@fp2fire.com)

2015 International Fire Code
Add new text as follows:

105.7.13 **Motor vehicle repair rooms and booths.** A construction permit is required to install or modify a motor vehicle repair room or booth. Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.

SECTION 202 DEFINITIONS

**MOTOR VEHICLE REPAIR ROOM.** A room designed to accommodate motor vehicle repair operations, constructed in accordance with the this code and separated from the remainder of the building by a minimum 1-hour fire barrier.

**MOTOR VEHICLE REPAIR SPACE.** An area in which lighter than air gaseous fuels may be present due to motor vehicle repair operations. The fire code official is authorized to define the limits of the motor vehicle repair space in any specific case.

**MOTOR VEHICLE REPAIR BOOTH.** A mechanically exhausted appliance of varying dimensions and construction provided to enclose or accommodate motor vehicle repair operations and to confine and limit the escape of lighter than air gaseous fuels.

CHAPTER 23 MOTOR FUEL-DISPENSING FACILITIES AND REPAIR GARAGES
SECTION 2311 REPAIR GARAGES

Revise as follows:

2311.7 **Repair garages for vehicles fueled by lighter-than-air fuels.** Repair garages shall be in accordance with Sections 2311.7 through 2311.7.2.4 in addition to the other requirements of Section 2311.

**Exceptions:**

1. Repair garages where work is not performed on the fuel system and is limited to exchange of parts and maintenance not requiring open flame or welding on the CNG-, LNG-, hydrogen- or other lighter-than-air-fueled motor vehicle.
2. Repair garages for hydrogen-fueled vehicles where work is not performed on the hydrogen storage tank and is limited to the exchange of parts and maintenance not requiring open flame or welding on the hydrogen-fueled vehicle. During the work, the entire hydrogen fuel system shall contain a quantity that is less than 200 cubic feet (5.6 m³) of hydrogen.

Add new text as follows:

2311.7.1 **Motor vehicle repair rooms** Motor vehicle repair rooms shall be enclosed with not less than 1-hour fire barriers constructed in accordance with Section 707 of the International Building Code, or horizontal assemblies constructed in accordance with Section 711 of the International Building Code, or both, with 1-hour rated opening protectives.

2311.7.2 **Motor vehicle repair booths** The design and construction of motor vehicle repair booths shall be in accordance with Sections 2311.7.2.1 through 2311.7.2.4.

2311.7.2.1 **Construction** Motor vehicle repair booths shall be constructed of approved noncombustible materials. Where walls or ceiling assemblies are constructed of sheet metal, single-skin assemblies shall be no thinner than 0.0478 inch (18 gage) (1.2 mm) and each sheet of double-skin assemblies shall be no thinner than 0.0359 inch (20 gage) (0.9 mm). Structural sections of motor vehicle repair booths are allowed to be sealed with latex-based or similar caulks and sealants.

2311.7.2.2 **Surfaces** The interior surfaces of motor vehicle repair booths shall be constructed so as to permit the free passage of exhaust air from all parts of the interior.

2311.7.2.3 **Means of egress** Means of egress shall be provided in accordance with Chapter 10.

**Exception:** Means of egress doors from premanufactured motor vehicle repair booths shall be not less than 30 inches (762
Motor vehicle repair booths shall be installed so that all parts of the booth are readily accessible for cleaning. A clear area of not less than 3 feet (914 mm) wide shall be maintained on all sides of the motor vehicle repair booth. This clear area shall be kept free of any storage or combustible construction.

Exceptions:

1. This requirement shall not prohibit locating a motor vehicle repair booth closer than 3 feet (914 mm) to or directly against an interior partition, wall or floor/ceiling assembly that has a fire-resistance rating of not less than 1 hour, provided the motor vehicle repair booth can be adequately maintained and cleaned.

2. This requirement shall not prohibit locating a motor vehicle repair booth closer than 3 feet (914 mm) to an exterior wall or a roof assembly, provided the wall or roof is constructed of noncombustible material and the motor vehicle repair booth can be adequately maintained and cleaned.

Motor vehicle repair spaces Where such spaces are not separately enclosed, noncombustible spray curtains shall be provided to restrict the spread of flammable gases.

Fire Protection Motor vehicle repair booths or spaces installed in a room or area protected by an automatic sprinkler system shall have the protection extended to include the inside of the motor vehicle repair booth or space.

Fire extinguishers Portable fire extinguishers complying with Section 906 shall be provided for motor vehicle repair rooms, motor vehicle repair booths, or motor vehicle repair spaces.

Ventilation. Repair garages used for the repair of natural gas- or hydrogen-fueled vehicles shall be provided with an approved mechanical ventilation system. The mechanical ventilation system shall be in accordance with the International Mechanical Code and Sections 2311.7.1.1 and 2311.7.1.2.

Exception: Repair garages with natural ventilation when approved.

Gas detection system. No change to text.

Defueling equipment required at vehicle maintenance and repair facilities. Facilities for repairing or replacing hydrogen fuel systems on hydrogen-fueled vehicles shall have equipment to defuel vehicle storage tanks. Where work must be performed on a vehicle's fuel storage tank for the purpose of maintenance, repair or cylinder certification, defueling and purging shall be conducted in accordance with Section 2309.6 and NFPA 2.

Reason: The purpose of this proposal is to limit the impact of application of the enhanced requirements necessary for the repair of vehicles that use CNG, liquefied natural gas (LNG), hydrogen or other lighter-than-air motor fuels. As currently written an entire motor vehicle repair facility must be constructed or renovated to these increased requirements even if a single bay space out of many is all that is required to service such vehicles.

The new language provides that the requirements apply to the room, which could be the entire service bay area or a room separated by 1 hour construction methods, to a motor vehicle repair booth, or a motor vehicle repair area. The requirements for the motor vehicle repair room/booth/area options have been copied from relevant portions of existing language in the IFC for spray finishing and modified for this application. The concept is the same, limit any increased hazard to a specific space (room/booth/area) and protect that limited area. The hazard presented by servicing lighter-than-air motor fuel vehicles is much less than flammable spray finishing. The motor vehicle repair booth could be prefabricated or field constructed as long as it meets the specified requirements.

This new option enhances the ease of acceptance of alternative motor fuels while properly addressing the additional hazards these vehicles may present with no reduction in the level of protection currently required to be met.

The language in the proposal closely mirrors the following existing language for spray rooms/booths/areas.

Defueling equipment required at vehicle maintenance and repair facilities. Facilities for repairing or replacing hydrogen fuel systems on hydrogen-fueled vehicles shall have equipment to defuel vehicle storage tanks. Where work must be performed on a vehicle's fuel storage tank for the purpose of maintenance, repair or cylinder certification, defueling and purging shall be conducted in accordance with Section 2309.6 and NFPA 2.

Reason: The purpose of this proposal is to limit the impact of application of the enhanced requirements necessary for the repair of vehicles that use CNG, liquefied natural gas (LNG), hydrogen or other lighter-than-air motor fuels. As currently written an entire motor vehicle repair facility must be constructed or renovated to these increased requirements even if a single bay space out of many is all that is required to service such vehicles.

The new language provides that the requirements apply to the room, which could be the entire service bay area or a room separated by 1 hour construction methods, to a motor vehicle repair booth, or a motor vehicle repair area. The requirements for the motor vehicle repair room/booth/area options have been copied from relevant portions of existing language in the IFC for spray finishing and modified for this application. The concept is the same, limit any increased hazard to a specific space (room/booth/area) and protect that limited area. The hazard presented by servicing lighter-than-air motor fuel vehicles is much less than flammable spray finishing. The motor vehicle repair booth could be prefabricated or field constructed as long as it meets the specified requirements.

This new option enhances the ease of acceptance of alternative motor fuels while properly addressing the additional hazards these vehicles may present with no reduction in the level of protection currently required to be met.

The language in the proposal closely mirrors the following existing language for spray rooms/booths/areas.

International Fire Code

2404.2 Location of spray-finishing operations.

Spray-finishing operations conducted in buildings used for Group A, E, I or R occupancies shall be located in a spray room protected with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 and separated vertically and horizontally from other areas in accordance with the International Building Code. In other occupancies, spray-finishing operations shall be conducted in a spray room, spray booth or spraying space approved for such use.

Exceptions:

1. Automobile undercoating spray operations and spray-on automotive lining operations conducted in areas with approved natural or mechanical ventilation shall be exempt from the provisions of Section 2404 when approved and where utilizing Class IIIA or IIIB combustible liquids.
2. In buildings other than Group A, E, I or R occupancies, approved limited spraying space in accordance with Section 2404.9.

3. Resin application areas used for manufacturing of reinforced plastics complying with Section 2409 shall not be required to be located in a spray room, spray booth or spraying space.

2404.3 Design and construction.
Design and construction of spray rooms, spray booths and spray spaces shall be in accordance with Sections 2404.3.1 through 2404.3.3.1.

2404.3.1 Spray rooms.
Spray rooms shall be constructed and designed in accordance with Section 2404.3.1.1 and the International Building Code, and shall comply with Sections 2404.4 through 2404.8.

2404.3.1.1 Floor.
Combustible floor construction in spray rooms shall be covered by approved, noncombustible, nonsparking material, except where combustible coverings, including but not limited to thin paper or plastic and strippable coatings, are utilized over noncombustible materials to facilitate cleaning operations in spray rooms.

2404.3.2 Spray booths.
The design and construction of spray booths shall be in accordance with Sections 2404.3.2.1 through 2404.3.2.6, Sections 2404.4 through 2404.8 and NFPA 33.

2404.3.2.1 Construction.
Spray booths shall be constructed of approved noncombustible materials. Aluminum shall not be used. Where walls or ceiling assemblies are constructed of sheet metal, single-skin assemblies shall be no thinner than 0.0478 inch (18 gage) (1.2 mm) and each sheet of double-skin assemblies shall be no thinner than 0.0359 inch (20 gage) (0.9 mm). Structural sections of spray booths are allowed to be sealed with latex-based or similar caulks and sealants.

2404.3.2.2 Surfaces.
The interior surfaces of spray booths shall be smooth; shall be constructed so as to permit the free passage of exhaust air from all parts of the interior, and to facilitate washing and cleaning; and shall be designed to confine residues within the booth. Aluminum shall not be used.

2404.3.2.3 Floor.
Combustible floor construction in spray booths shall be covered by approved, noncombustible, nonsparking material, except where combustible coverings, including but not limited to thin paper or plastic and strippable coatings, are utilized over noncombustible materials to facilitate cleaning operations in spray booths.

2404.3.2.4 Means of egress.
Means of egress shall be provided in accordance with Chapter 10.

Exception: Means of egress doors from premanufactured spray booths shall be not less than 30 inches (762 mm) in width by 80 inches (2032 mm) in height.

2404.3.2.5 Clear space.
Spray booths shall be installed so that all parts of the booth are readily accessible for cleaning. A clear space of not less than 3 feet (914 mm) shall be maintained on all sides of the spray booth. This clear space shall be kept free of any storage or combustible construction.

Exceptions:
1. This requirement shall not prohibit locating a spray booth closer than 3 feet (914 mm) to or directly against an interior partition, wall or floor/ceiling assembly that has a fire-resistance rating of not less than 1 hour, provided the spray booth can be adequately maintained and cleaned.

2. This requirement shall not prohibit locating a spray booth closer than 3 feet (914 mm) to an exterior wall or a roof assembly, provided the wall or roof is constructed of noncombustible material and the spray booth can be adequately maintained and cleaned.

International Building Code
SECTION 416
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 application of flammable finishes. Such construction and equipment shall comply with the International Fire Code.

[F] 416.2 Spray rooms.
Spray rooms shall be enclosed with not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. Floors shall be waterproofed and drained in an approved manner.
[F] 416.2.1 Surfaces.
The interior surfaces of spray rooms shall be smooth and shall be so constructed to permit the free passage of exhaust air from all parts of the interior and to facilitate washing and cleaning, and shall be so designed to confine residues within the room. Aluminum shall not be used.

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

[F] 416.3 Spraying spaces.
Spraying spaces shall be ventilated with an exhaust system to prevent the accumulation of flammable mist or vapors in accordance with the International Mechanical Code. Where such spaces are not separately enclosed, noncombustible spray curtains shall be provided to restrict the spread of flammable vapors.

[F] 416.3.1 Surfaces.
The interior surfaces of spraying spaces shall be smooth and continuous without edges; shall be so constructed to permit the free passage of exhaust air from all parts of the interior and to facilitate washing and cleaning; and shall be so designed to confine residues within the spraying space. Aluminum shall not be used.

[F] 416.4 Spray booths.
Spray booths shall be designed, constructed and operated in accordance with the International Fire Code.

[F] 416.5 Fire protection.
An automatic sprinkler system or 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.

SPRAY BOOTH. A mechanically ventilated appliance of varying dimensions and construction provided to enclose or accommodate a spraying operation and to confine and limit the escape of spray vapor and residue and to exhaust it safely.

SPRAY ROOM. A room designed to accommodate spraying operations, constructed in accordance with the International Building Code and separated from the remainder of the building by a minimum 1-hour fire barrier.

SPRAYING SPACE. An area in which dangerous quantities of flammable vapors or combustible residues, dusts or deposits are present due to the operation of spraying processes. The fire code official is authorized to define the limits of the spraying space in any specific case.

Cost Impact: Will not increase the cost of construction
This proposal will not increase the cost of construction and will likely reduce the cost of construction by limiting the impact of the additional code requirements for these motor vehicles.

F275-16 : 2311.7-
DAVIDSON12767

Public Hearing Results

Committee Action: Disapproved
Committee Reason: The proposal was disapproved based upon concerns with the definitions as proposed and the fact that this concept is just now being addressed within NFPA 2. In addition there was a preference to F276-16 which makes a more broad reference to NFPA 2.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:
Proponent : Robert Davidson, Davidson Code Concepts, LLC, representing Quong & Associates, Inc./Toyota (rjd@davidsoncodeconcepts.com); Michael O’Brien representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

SECTION 202 - MOTOR VEHICLE REPAIR ROOM.
A room designed to accommodate motor vehicle repair operations, constructed in accordance with this code and separated from the remainder of the building by a minimum 1-hour fire barrier.
SECTION 202 MOTOR VEHICLE REPAIR SPACE.
An area in which lighter than air gaseous fuels may be present due to motor vehicle repair operations. The fire code official is authorized to define the limits of the motor vehicle repair space in any specific case.

SECTION 202 MOTOR VEHICLE REPAIR BOOTH.
A mechanically exhausted appliance of varying dimensions and construction provided to enclose or accommodate motor vehicle repair operations and to confine and limit the escape of lighter than air gaseous fuels.

2311.7.2.1 Construction Motor vehicle repair booths shall be constructed of approved noncombustible materials. Where walls or ceiling assemblies are constructed of sheet metal, single-skin assemblies shall be no thinner than 0.0478 inch (18 gage) (1.2 mm) and each sheet of double-skin assemblies shall be no thinner than 0.0359 inch (20 gage) (0.9 mm). Structural sections of motor vehicle repair booths shall be sealed with latex-based or similar caulks and sealants in an approved manner.

Commenter's Reason: This public comments asks that you overturn the committee decision to disapprove and to approve the proposal as modified by this public comment.

During testimony and committee discussion the main reason for the disapproval was that the language belongs in NFPA 2, the Hydrogen Technology Code with a reference to NFPA 2 in the IFC as has been done for most technical requirements addressing hydrogen applications. As the proponent I did testify that work is being done to place similar language in NFPA 2. However, this technical language needs to be incorporated into the IFC in addition to NFPA 2. The first reason is that based upon differing cycle change cycles between the IFC and NFPA 2, if the language is not added to the IFC for the 2018 edition, the sooner this beneficial method of protecting repair operations for hydrogen fueled vehicles could be referenced through NFPA 2 would be the 2021 edition of the IFC.

The second, and most important, reason for adding the language to the IFC is that it does not only apply to hydrogen fueled vehicles. As proposed it applies to all lighter than air gaseous fueled vehicles since the hazard being addressed, escape of fuel gas from the fuel system, is the same. If the language is not added to the IFC and only a reference to NFPA 2 is utilized, only hydrogen fueled vehicles repair facilities will benefit.

The modifications proposed address two items that came up during testimony. A committee member felt the additional definitions were confusing, those definitions are proposed to be deleted, they are not needed for the proposed language to function. Testimony from the floor questioned the sealants referenced in the booth construction language, though this language currently exists in Section 2404.3.2.1 of the code for paint spray booths, it has been deleted and replaced with language that the method applied shalled be done in an approved manner, i.e., the method will be part of the submitted plans for review and approval.
Proposed Change as Submitted

Proponent: Dan Bowerson, NGVAmerica, representing NGVAmerica Technology & Development Committee (dbowerson@ngvamerica.org); Myra Blaylock, representing TBD (mlblayl@sandia.gov)

2015 International Fire Code

Revise as follows:

2311.7.1 Ventilation. Repair garages used for the repair of natural gas- or hydrogen-fueled vehicles shall be provided with an approved mechanical ventilation system. The mechanical ventilation system shall be in accordance with the International Mechanical Code and Sections 2311.7.1.1 and 2311.7.1.2.

Exception: Repair garages with natural ventilation when approved.

1. Repair garages with natural ventilation when approved.
2. Natural gas vehicle repair garages complying with the ventilation rates of Table 403.3.1.1 of the International Mechanical Code are not required to meet the ventilation requirements of this section.

Reason:

Bowerson: Based on the findings of the Sandia Report (SAND2014-2342), the credible natural gas releases during LNG and CNG vehicle maintenance operations are limited to about 128,700 BTUs of fuel over a very short time frame. The released natural gas dissipates quickly and is typically ignitable from the point of release to no more than eight feet from that point. These releases do not create an ignitable mixture at the ceiling of the facility due to rapid dispersion of the gas and ventilation above the normal ventilation rates of a typical repair has little or no impact on the dispersion. There has not been any reported release of a full CNG cylinder due to any maintenance operation in the last 35 years of record keeping. In the 1990's there were full cylinder releases due to faulty temperature activated pressure relief device (TPRD) designs, but they have been eliminated from the population and were not related to maintenance operations. They are longer a hazard as indicated by the section 2311.7 exception 1.

Additional Information:

CNG, or gas phase LNG, released due to maintenance on the fuel lines and associated equipment without proper defueling and purging of those systems: It is estimated that less than 150 cu. ft. of natural gas is released at varying pressures based on the specific fuel system. Mitigation of the hazard associated with these releases is covered in the SANDIA Report, SAND2014-2342, which indicates the hazardous areas (extent of ignitable mixtures) and time to dispersion of released gas. Mitigation of this risk is addressed in this proposal.

Blaylock: To develop a comprehensive analysis into existing regulatory issues regarding NGV maintenance facility operations, the Clean Vehicle Education Foundation (CVEF) partnered with Sandia National Laboratories (SNL) to take advantage of Sandia’s extensive experience performing similar analyses in support of hydrogen refueling infrastructure. A full report on the findings of these investigations can be found in “Analyses in Support of Risk-Informed Natural Gas Vehicle Maintenance Facility Codes and Standards: Phase I” by Ekoto, et. al. (SAND2014-2342). A synopsis of relevant information is presented below.

For the hazard analysis work, detailed Computational Fluid Dynamics (CFD) simulations were performed at Sandia to examine the three release scenarios identified from a hazard and operability study (HAZOP) analysis: (1) a dormant LNG blow-off, (2) indoor CNG fuel system purge downstream of the storage isolation valves, and (3) a full-scale CNG tank blow-down due to a failure of the pressure relief device (PRD). Methane was used as a proxy for natural gas in the simulations. The reference NGV facility had dimensions of 30.5 m long, 15.2 m wide and 6.1 m tall, with pitched roof. Geometries with and without solid, evenly spaced roof rafters were examined. The impact of active ventilation at the commonly prescribed rate of 5 air changes per hour versus a facility with passive ventilation was considered. For conditions with mechanical ventilation, air was forced into the enclosure 750 seconds before the start of the release to ensure internal steady flows. The vehicle was modeled as a cuboid (2.44 x 2.44 x 3.42 m³) and placed in the center of the NGV maintenance facility.

From velocity maps within the NGV maintenance facility, ventilation currents were observed to form recirculation regions when they interacted with the vehicle or roof structures, which could distort the release plumes and generate accumulation regions for flammable mixture. However, for the scenarios investigated, little sensitivity in the development of flammable regions was observed for simulations with or without active ventilation. This was due to the small duration of the release relative to the ventilation rate. Similarly, the sensitivity of flammable mixture development with facility layouts with or without roof rafters was likewise weak as the mixtures were generally already lean by the time they reached the rafters. The LNG blow-off scenario was modeled as a constant leak for five minutes. During that time the amount of flammable mass quickly reached a steady state, and dissipated within seconds of the leak stopping. For the case of the indoor CNG fuel system purge downstream of the storage isolation valves, the gas was purged from the line within 30 seconds, and the gas was within the flammable concentration limits only during the time of this blowdown. For both of these cases, the leaked gas was in the flammable range...
only within an area of several feet from the leak source: less than two feet for case (1) and less than 10 feet for case (2). In neither case did the area of flammable mass reach the ceiling. For case (1) simulations with and without ventilation were compared. While the ventilation did slightly lower the amount of flammable mass, it did not alleviate it completely. For the low-flow release scenarios that involved a dormant LNG blow-off or a CNG fuel system purge, peak overpressures predicted by the FM Global overpressure model with input flammable mass values from the CFD simulations were well below 1 kPa—no significant hazard is expected for such a low overpressure.


Cost Impact: Will not increase the cost of construction  
Bowerson: This proposal will eliminate the cost for additional ventilation requirements for natural gas vehicle repair garages.  
Blaylock: Since the proposed change is an exception to the ventilation requirements, it would not increase the cost of construction.

Committee Action: Disapproved
Committee Reason: This proposal to simply allow compliance with Table 403.3.1.1 of the IMC was a concern due to future changes that occur to that table. Though it was noted that in some cases the ventilation rates warrant relaxation.

Assembly Action: None

Public Comment 1:
Proponent: Ted Williams, representing American Gas Association (twilliams@aga.org) requests Approve as Modified by this Public Comment.

Modify as Follows:
2015 International Fire Code
2311.7.1 Ventilation. Repair garages used for the repair of natural gas- or hydrogen-fueled vehicles shall be provided with an approved mechanical ventilation system. The mechanical ventilation system shall be in accordance with the International Mechanical Code, and Sections 2311.7.1.1 and 2311.7.1.2.

Exceptions:
1. Repair garages with natural ventilation when approved.
2. Natural gas vehicle repair garages complying provided with the a ventilation rates rate of Table 403.3.1.1 of the International Mechanical code, not less than .75 cfm/ft²—are not required to meet the ventilation requirements of this section.

Commenter's Reason: Based on the findings of the Sandia Report (SAND2014-2342), the credible natural gas releases during LNG and CNG vehicle maintenance operations are limited to about 128,700 BTUs of fuel over a very short time frame. The released natural gas dissipates quickly and is typically ignitable from the point of release to no more than
eight feet from that point. These releases do not create an ignitable mixture at the ceiling of the facility due to rapid
 dispersion of the gas and ventilation above the normal ventilation rates of a typical repair has little or no impact on
 the dispersion. There has not been any reported release of a full CNG cylinder due to any maintenance operation in
 the last 35 years of record keeping. In the 1990's there were full cylinder releases due to faulty temperature
 activated pressure relief device (TPRD) designs, but they have been eliminated from the population and were not
 related to maintenance operations. They are longer a hazard as indicated by the section 2311.7 exception 1.

Additional Information:

CNG, or gas phase LNG, released due to maintenance on the fuel lines and associated equipment without proper
defueling and purging of those systems: It is estimated that less than 150 cu.ft. of natural gas is released at varying
pressures based on the specific fuel system. Mitigation of the hazard associated with these releases is covered in
the SANDIA Report, SAND2014-2342, which indicates the hazardous areas (extent of ignitable mixtures) and time to
dispersion of released gas. Mitigation of this risk is addressed in this proposal.

Note: The Sandia report cited above was provided with the original proposal.

The modification proposed addresses a specific concern of the IFC Committee regarding stability of Table 403.3.1.1 of the IMC
and potential changes by citing a specific ventilation rate from the current IMC table. This specific ventilation rate addresses
the “Committee Reason” statement that “the ventilation rates warrant relaxation” by employing the IMC ventilation rates in the
2015 edition as the baseline ventilation needed for natural gas maintenance facilities.

Facility Codes and Standards: Phase 1, March 2014.

Proponent: Dan Bowerson, representing NGVAmerica Technology & Development Committee
dbowerson@ngvamerica.org) requests Approve as Submitted.

Commenter's Reason: To address the committee's reason “This proposal to simply allow compliance with Table 403.3.1.1 of
the IMC was a concern due to the future changes that occur to that table. Though it was noted that in some cases the
ventilation rates warrant relaxation”, the exception for repair garages with natural ventilation when approved, or the 2015
edition of the IMC Table 403.3.1.1, the lower ventilation rates are an appropriate “relaxation”.

SAND2014-2342. Ekoto, Blaylock, etc. 2014.
Proposed Change as Submitted

Propponent: Dan Bowerson, representing NGV America Technology & Development Committee (dbowerson@ngvamerica.org)

2015 International Fire Code

Revise as follows:

2311.7.2.2 Operation. Activation of the gas detection system shall result in all the following:

1. Initiation of distinct audible and visual alarm signals in the repair garage.
2. Deactivation of all heating systems located in the repair garage for hydrogen-fueled vehicles and deactivation of all open flame heaters or heating equipment with exposed surfaces having a temperature in excess of 399°C (750°F) for LNG vehicles.
3. Activation of the mechanical ventilation system, where the system is interlocked with gas detection.

Reason: Since the gas phase of LNG has an ignition temperature of greater than 1,000°F, some heating system designs may not need to be deactivated when the gas detection system is activated due to a leak. This is consistent with the requirements in NFPA 30A section 7.6.6.


Cost Impact: Will not increase the cost of construction
Due to the fact that some heating equipment will may not have to be deactivated due to the activation of the gas detection system, this proposal has the potential to reduce the cost for maintenance facility operators.

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The proposal was disapproved as the different fuel types should be addressed separately. Also, more background on the temperature criteria was necessary.

Assembly Action: None

Individual Consideration Agenda

Proponent: Dan Bowerson, representing NGV America Technology & Development Committee (dbowerson@ngvamerica.org) requests Approve as Submitted.

Commenter's Reason: Along with the original proposal reasons, the differentiation of hydrogen and natural gas (methane) is justified on the basis that hydrogen is a Class I, Division Group B combustible material under NFPA 497, Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas, 2012 Edition; whereas methane is a Group D combustible material, having a less hazardous flammability range, and "minimum experiment flame gas" (MEFG) for flame propagation. These classifications are reported in NFPA 497 and other standard sources.

Original Reasons:
Since the gas phase of LNG has an ignition temperature of greater than 1,000°F, some heating system designs may not need to be deactivated when the gas detection system is activated due to a leak. This is consistent with the requirements in NFPA 30A section 7.6.6.
Proponent: Ted Williams, representing American Gas Association (twilliams@aga.org) requests Approve as Submitted.

Commenter's Reason: Since the gas phase of LNG has an ignition temperature of greater than 1,000°F, some heating system designs may not need to be deactivated when the gas detection system is activated due to a leak. This is consistent with the requirements in NFPA 30A section 7.6.6. In addition, hazards of natural gas (methane) and hydrogen, both in vapor state, are differentiated based on the fact that hydrogen is a Class I, Division Group B combustible material under NFPA 497, "Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas, 2012 Edition," whereas methane is a Group D combustible material, having a less hazardous flammability range, and "minimum experiment flame gas" (MEFG) for flame propagation. These classifications are reported in NFPA 497 and other standard sources.


**Proposed Change as Submitted**

**Proponent:** Dan Bowerson, NGVAmerica, representing NGVAmerica Technology & Development Committee  
dbowerson@ngvamerica.org

**2015 International Fire Code**

**Revise as follows:**

**2311.7.2.3 Failure of the gas detection system.** Failure of the gas detection system shall result in the deactivation of the heating systems for hydrogen-fueled vehicles and deactivation of all open flame heaters or heating equipment with exposed surfaces having a temperature in excess of 399ºC (750ºF) for LNG vehicles and activation of the mechanical ventilation system for hydrogen-fueled vehicle repair facilities where the system is such systems are interlocked with the gas detection system and cause a trouble signal to sound in an approved location.

**Reason:** Since CNG, and the gas phase of LNG, has an ignition temperature of greater than 1,000°F some heating system designs may not need to be deactivated when the gas detection system is activated due to a leak. This is consistent with the requirements in NFPA 30A section 7.6.6 and per rationale for the NGVAmerica Technology & Development Committee proposal for section 2311.7.1. LNG gas phase releases, as shown in the SANDIA report (SAND2014-2342) do not benefit from additional ventilation to dissipate the released gas.


**Cost Impact:** Will not increase the cost of construction

Due to the fact that some heating equipment may not have to be deactivated due to the activation of the gas detection system, this proposal has the potential to reduce the cost for maintenance facility operators.

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**Public Hearing Results**

**Committee Action:** Disapproved

**Committee Reason:** The revisions need to clarify whether it is the heating systems of the vehicles or the building. This proposal needs to be correlated with F75-16 dealing with a larger rewrite related to gas detection systems.

**Assembly Action:** None

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**Individual Consideration Agenda**

**Proponent:** Dan Bowerson, representing NGVAmerica Technology & Development Committee  
dbowerson@ngvamerica.org requests Approve as Submitted.

**Commenter's Reason:** Along with the original proposal reasons, the differentiation of hydrogen and natural gas (methane) is justified on the basis that hydrogen is a Class I, Division Group B combustible material under NFPA 497, Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas, 2012 Edition; whereas methane is a Group D combustible material, having a less hazardous flammability range, and "minimum experiment flame gas" (MEFG) for flame propagation. These classifications are reported in NFPA 497 and other standard sources.

**Original Reason:**

Since CNG, and the gas phase of LNG, has an ignition temperature of greater than 1,000°F some heating system designs may not need to be deactivated when the gas detection system is activated due to a leak. This is consistent with the requirements in NFPA 30A section 7.6.6 and per rationale for the NGVAmerica Technology & Development Committee proposal for section...
2311.7.1. LNG gas phase releases, as shown in the SANDIA report (SAND2014-2342) do not benefit from additional ventilation to dissipate the released gas.


**Proponent:** Ted Williams, representing American Gas Association (twilliams@aga.org) requests Approve as Submitted.

**Commenter's Reason:** Since the gas phase of LNG has an ignition temperature of greater than 1,000ºF, some heating system designs may not need to be deactivated when the gas detection system is activated due to a leak. This is consistent with the requirements in NFPA 30A section 7.6.6. In addition, hazards of natural gas (methane) and hydrogen, both in vapor state, are differentiated based on fact that hydrogen is a Class I, Division Group B combustible material under NFPA 497, "Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas, 2012 Edition," whereas methane is a Group D combustible material, having a less hazardous flammability range, and "minimum experiment flame gas" (MEFG) for flame propagation. These classifications are reported in NFPA 497 and other standard sources.


Committee Action: Disapproved

Assembly Action: None

Proposed Change as Submitted

Proponent: William Winslow, representing Self (will-winslow@comcast.net)

2015 International Fire Code

2404.7.1 Operation. Mechanical ventilation shall be kept in operation at all times while spraying operations are being conducted and for a sufficient time thereafter to allow vapors from drying coated articles and finishing material residue to be exhausted. Spraying equipment shall be interlocked with the ventilation of the flammable vapor areas such that spraying operations cannot be conducted unless the ventilation system is in operation.

Add new text as follows:

2404.7.1.1 Testing The interlock required by Section 2404.7.1 shall be tested annually and a record shall be kept in accordance with Section 107.3.

Reason: In the IFC, some safety interlocks require testing and others don’t. The purpose of this code change is to work towards a consistent approach by requiring safety interlocks to be tested.

Cost Impact: Will not increase the cost of construction

No cost increase is expected from this code change proposal. This code change is for the testing of existing equipment only. As a result, it does not require a change in construction and there is no cost increase.

Public Hearing Results

Committee Reason: The proposal was disapproved based upon the action taken on code change proposal F286-16.

Assembly Action: None

Individual Consideration Agenda

Proponent: William Andrews, City of Richmond, Fire Marshal’s office, representing City of Richmond, Virginia; Fire Marshal’s office (william.andrews@richmondgov.com) requests Approve as Submitted.

Commenter’s Reason: Prior proposal rejected since need heat over 200 degrees. This proposal simply needs turn off fan, thus reasonable annual test. Please adopt this requirement for annual test of spray ventilation fan interlock, so can’t spray if fan not operating.

F287-16
Proposed Change as Submitted

Proponent: William Koffel, Koffel Associates, Inc., representing National Wooden Pallet and Container Association (wkoffel@koffel.com)

2015 International Fire Code

SECTION 2810 OUTDOOR STORAGE OF PALLETS AT PALLET MANUFACTURING AND RECYCLING FACILITIES

2810.1 General The outside storage of wood pallets and wood composite pallets on the same site as a manufacturing or recycling facility shall comply with Sections 2810.1 through 2810.11.

2810.2 Site Plan Each site shall maintain a current site plan that includes a general description of the property, the boundaries of the lot, the size and location of buildings, and shall include all of the following:

1. Utilities
2. Type of construction and presence of sprinkler protection for other buildings on the site
3. Water supply sources for fire fighting purposes
4. Location of hazardous material storage areas
5. Location of pallet storage
6. Equipment protected with a dust collection system
7. Fire apparatus access roads
8. Designated smoking areas
9. Location of fire alarm control panels

2810.3 Fire Prevention Plan The owner or owners authorized representative shall prepare an approved fire prevention plan that includes all of the following:

1. Frequency of walk through inspections to verify compliance with the plan
2. Hot work permit process in accordance with Chapter 35
3. Preventive maintenance program for equipment associated with pallet activities
4. Inspection, testing, and maintenance of fire protection systems in accordance with Chapter 9

2810.4 Fire Safety and Emergency Evacuation Plan The owner or owners authorized representative shall prepare and train employees in an approved emergency evacuation plan in accordance with Chapter 4.

2810.5 Security Management Plan The owner or owners authorized representative shall prepare a security management plan based on a security risk assessment and shall make the plan and assessment available to the fire code official upon request.

2810.6 Clearance to Property Line Stacks of pallets shall not be stored within 0.75 times the stack height or 8 feet of the property line, whichever is greater, or shall comply with Section 2810.11.

2810.7 Clearance to Important Buildings Stacks of pallets shall not be stored within 0.75 times the stack height of any important building on site or shall comply with Section 2810.11.

2810.8 Height Pallet stacks shall not exceed 20 ft (6 m) in height.

2810.9 Fire Flow Fire flow requirements for the site shall be determined by the fire code official.

2810.10 Portable Fire Extinguishers Portable fire extinguishers shall be provided with 75 ft (23 m) of any pallet stack.

2810.11 Alternative Approach, Where approved by the fire code official pallet stacks located closer to a property line or structure than as required by Sections 2810.6 and 2810.7 shall be provided with additional fire protection including, but not limited to, the following:

1. The storage yard areas and materials-handling equipment selection, design, and arrangement are based upon an approved risk assessment.
2. Automatic fire detection which transmits an alarm to a supervising station in accordance with NFPA 72 is provided.
3. Fire apparatus access roads are provided around all storage areas.

403.6 Group F occupancies. An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for buildings containing a Group F occupancy where the Group F occupancy has an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge. Following conditions apply:

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1. The Group F occupancy has an occupant load of 500 or more persons
2. The Group F occupancy has an occupant load more than 100 persons above or below the lowest level of exit discharge.
3. Group F pallet manufacturing and recycling facilities as required by Section 2810.

Reason: Outdoor pallet storage areas for manufacturing and recyclers of pallets should be exempt from the requirements for the storage of idle pallets because pallets are not idle, nor managed in an idle fashion, at these types facilities. Pallet manufacturers and recyclers have intimate knowledge of their pallet inventory, as it is considered an asset.

The storage areas are fluid environments where pallets are being moved and replaced on a daily basis. The outdoor storage area of pallet manufacturing and recycling facilities is an active management environment. Personnel are a constant presence within the storage area so that fire hazards can be identified and reported to take immediate corrective action. Storage yards are organized by pallet type and into recycle streams for high operational efficiency, kept sufficiently free of waste and debris, and perimeters are well maintained.

For these reasons, a new section is proposed which would uniquely apply to pallet manufacturing and recycling facilities. The intent of the new section is to reduce the likelihood of fire at pallet manufacturing and recycling facilities through best practices. In the event that a fire does occur, measures are described that will mitigate the spread of fire to adjoining structures and properties through the establishment of pallet pile spacing between buildings and property lines.

"Important building", as used in Chapters 23, 57, and 61, is already a defined term in NFPA 30. It is the same concept as used for tank storage of flammable and combustible liquids.

Cost Impact: Will not increase the cost of construction
The requirements proposed represent best practices of the industry. As such, there will not be an increase in cost for some operators. Others may experience an increased cost to comply with the requirements.

Committee Reason: The proposal was approved as it addresses concerns related to the safety issue of pallet storage that had been raised in previous code change cycles. The modification addresses several issues. The first was clarifying within Section 2810.1 that the scope was limited to wood pallets and wood composite pallets only. The second modification provided the language that clarified that the distance was measured from the property line. Finally the last modification added recycling facilities as they had been omitted.

Assembly Action: None
Public Comment 1:

Proponent: William Koffel, Koffel Associates, Inc., representing National Wooden Pallet and Container Association (wkoffel@koffel.com) requests Approve as Modified by this Public Comment.

Further Modify as Follows:

2015 International Fire Code

SECTION 2810 OUTDOOR STORAGE OF PALLETS AT PALLET MANUFACTURING AND RECYCLING FACILITIES

2810.1 General The outside storage of wood pallets and wood composite pallets on the same site as a pallet manufacturing or pallet recycling facility shall comply with Sections 2810.1 through 2810.11.

2810.2 Site Plan Each site shall maintain a current site plan that includes a general description of the property, the boundaries of the lot, the size, and location of buildings, approval and shall include all of the following:

1. Lot lines
2. Utilities
3. Type of construction and presence of sprinkler protection for other buildings on the site
4. Presence of fire protection systems
5. Water supply sources for fire fighting purposes
6. Location of hazardous material storage areas
7. Location of pallet storage
8. Equipment protected with a dust collection system
9. Fire apparatus access roads
10. Designated smoking areas
11. Location of fire alarm control panels

2810.3 Fire Prevention Plan The owner or owners authorized representative shall prepare an approved fire prevention plan for review and approval by the fire code official that includes all of the following:

1. Frequency of walk through inspections to verify compliance with the fire prevention plan
2. Hot work permit process in accordance with Chapter 35
3. Preventive maintenance program for equipment associated with pallet activities
4. Inspection, testing, and maintenance of fire protection systems in accordance with Chapter 9

2810.4 Fire Safety and Emergency Evacuation Plan The owner or owners authorized representative shall prepare and train employees in an approved fire safety and evacuation plan in accordance with Chapter 4.

2810.5 Security Management Plan The owner or owners authorized representative shall prepare a security management plan based on a security risk assessment and shall make the plan and assessment available to the fire code official upon request.

2810.6 Clearance to Property Line Stacks of pallets shall not be stored within 0.75 times the stack height or 8 feet of the property line, whichever is greater, or shall comply with Section 2810.11.

2810.7 Clearance to Important Buildings Stacks of pallets shall not be stored within 0.75 times the stack height of any important building on site or shall comply with Section 2810.11.

2810.8 Height Pallet stacks shall not exceed 20 ft (6 m) in height.

2810.9 Fire Flow Fire flow requirements for the site shall be determined by the fire code official.

2810.10 Portable Fire Extinguishers Portable fire extinguishers shall be provided, selected, installed and maintained in accordance with 75 ft (23 m) of any pallet stack Section 906.

2810.11 Alternative Approach. Where approved by the fire code official, pallet stacks are permitted to be located closer to a property line or structure than as required by Sections 2810.6 and 2810.7 shall be provided with:

1. The storage yard areas and materials-handling equipment selection, design, and arrangement are based upon an approved risk assessment.
2. Automatic fire detection which transmits an alarm to a supervising station in accordance with NFPA 72 is provided.
3. Fire apparatus access roads are provided around all storage areas.
403.6 Group F occupancies. An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for buildings containing a Group F occupancy where any of the following conditions apply:

1. The Group F occupancy has an occupant load of 500 or more persons
2. The Group F occupancy has an occupant load more than 100 persons above or below the lowest level of exit discharge.
3. Group F pallet manufacturing and recycling facilities as required by Section 2810.

Commenter's Reason: As promised during the Committee Action Hearings, the industry has continued to solicit feedback and comments from interested parties. The Public Comment attempts to address the feedback and comments received from both the Committee and other interested parties after the hearings. Many of the proposed changes are editorial. The substantive changes include the following:

Section 2810.2 - The proposed language clarifies that the site plan must be approved by the fire code official. In addition, the reference to sprinkler systems has been expanded to all fire protection systems. It should be noted that comments were received suggesting that the fire apparatus access road line should reference 503.1.1. This proposed change is not included within the Public Comment because the industry believes that existing fire apparatus access should be shown on the site plans regardless of when they were established. A reference to 503.1.1 in this Section, as proposed by some, would result in a requirement that fire apparatus access needs only to be addressed for new facilities. The application of Section 503 to new facilities still applies and is not impacted by the lack of a reference to Section 503 in this Section.

Section 2810.4 - Editorial correction to use the phrase that is currently used in Chapter 4.

Section 2810.10 - During the CAH, it was recommended that a reference to Section 906. Others recommended that a specific portable fire extinguisher size be provided. After consultation with the FCAC during their July meeting, the final proposed language was developed to simply reference Section 906. Section 906 provides the necessary guidance regarding the selection (including size) and walking distance to portable fire extinguishers.
Proposed Change as Submitted

2015 International Fire Code

Add new text as follows:

105.6.36 Outdoor assembly event An operational permit is required to conduct an outdoor assembly event where planned attendance exceeds 1000 persons. Application for said permit shall be made no less than ten days prior to the planned start date of the event.

Add new definition as follows:

SECTION 202 OUTDOOR ASSEMBLY EVENT
An outdoor gathering of persons for purposes such as civic, social, or religious functions; recreation, entertainment, food or drink consumption or under which persons gather for any purpose.

Revise as follows:

CHAPTER 31 TENTS AND OTHER MEMBRANE STRUCTURES AND OUTDOOR ASSEMBLY EVENTS

3101.1 Scope. Tents, temporary stage canopies and membrane structures shall comply with this chapter. The provisions of Section 3103 are applicable only to temporary tents and membrane structures. The provisions of Section 3104 are applicable to temporary and permanent tents and membrane structures. The provisions of Section 3106 are applicable to outdoor assembly events. Other temporary structures shall comply with the International Building Code.

3103.3 Place of Outdoor assembly event For the purposes of this chapter, a place of an outdoor assembly event shall include a circus, carnival, tent show, theater, skating rink, dance hall or other place of assembly in or under which persons gather for any purpose.

3104.1 General. Tents and membrane structures, both temporary and permanent, shall be in accordance with this section and Section 3106. Permanent tents and membrane structures shall also comply with the International Building Code.

3104.12 Portable fire extinguishers. Portable Approved portable fire extinguishers complying with Section 906 shall be provided at each exit and other locations as required by Section 906 the fire code official.

Add new text as follows:

SECTION 3106 OUTDOOR ASSEMBLY EVENTS

3106.1 Scope. All outdoor assembly events shall comply with this Section.

3106.2 General Outdoor assembly events shall be in accordance with this Section and Section 403.12. Temporary structures erected for outdoor assembly events shall comply with this Chapter.

3106.2.1 Approval required, Outdoor assembly events shall be approved by the fire code official.

3106.2.2 Permits An operational permit shall be required as set forth in Section 105.6.

3106.2.3 Access Fire apparatus access roads shall be provided in accordance with Section 503.

3106.2.3.1 Fire service features Unobstructed access to fire hydrants, drafting sources and other fire protection features shall be maintained at all times.

3106.3 Occupancy and means of egress The number and location of emergency egress and escape routes shall be approved by the fire code official.

3106.3.1 Occupant load The fire code official shall establish an occupant load for the event site.

3106.3.2 Maintenance of emergency egress and escape routes Emergency egress and escape routes shall be maintained at all times.

3106.4 Public safety for events All outdoor assembly events shall comply with with Sections 3106.4.1 through 3106.4.7

3106.4.1 Public safety plan for gatherings A public safety plan shall be prepared in accordance with section 403.12.2. The public safety plan shall be submitted for approval by the fire code official with the application for an operational permit as required by Section 3106.2.2

Exception: Where the fire code official determines that the nature of the outdoor assembly event does not pose an increased hazard to public safety.
3106.4.2 Weather monitoring person Where required by the fire code official, the event operator or agent shall designate one qualified individual to continuously monitor local weather reports, forecasts and conditions. Said person will be responsible to order the suspension or cancellation of the outdoor assembly event and issue the evacuation signal in accordance with the approved all-hazard safety and evacuation plan.

3106.4.3 Crowd managers Where events involve a gathering of more than 1,000 people, trained crowd managers shall be provided in accordance with Section 403.12.3.

3106.4.4 Fire Extinguishers Fire extinguishers shall be provided in accordance with Section 906 and placed in locations approved by the fire code official.

3106.4.5 Smoking Smoking shall be permitted only in designated areas. All other areas shall have approved “No Smoking” signs conspicuously posted and maintained in accordance with Section 310.

3106.4.6 Combustible vegetation Combustible vegetation that could create a fire hazard shall be removed from the outdoor assembly event area.

3106.4.7 Combustible refuse Combustible refuse shall be kept in noncombustible containers with tight-fitting or self-closing lids. Combustible refuse shall be removed from the event site at regular intervals to prevent an unsafe accumulation within the event site.

3106.5 Cooking appliances or devices. Outdoor assembly events with concession stands or booths using cooking appliances or devices shall comply with Sections 3106.5.1 through 3106.5.4.

3106.5.1 Public isolation Cooking appliances or devices shall be isolated from the public by not less than 4 feet (1219 mm) or by a non-combustible 3-sided barrier between the cooking appliances or devices and the public.

3106.5.2 Separation from tents or structures Cooking appliances or devices that produces sparks or grease-laden vapors or flying embers (firebrands) shall not be performed within 20 feet (6096 mm) of a tent or temporary structure.

Exceptions:
1. Designated cooking tents not occupied by the public when approved by the fire code official
2. Tents or structures where cooking appliances are protected with an automatic fire extinguishing system in accordance with Section 904.12

3106.5.3 Protection Cooking equipment using combustible oils or solids shall meet the following:

1. A noncombustible lid shall be immediately available. The lid shall be of sufficient size to cover the cooking well completely.
2. The equipment shall be placed on a noncombustible surface.
3. An approved portable fire extinguisher for the protection of cooking grease fires shall be provided at a location approved by the fire code official.

3106.5.4 Liquefied petroleum gas (LP-gas). The use of liquefied petroleum gas (LP-gas) shall be in accordance with Chapter 61.

3106.6 Electrical equipment and wiring Outdoor assembly events with concession stands or booths using electrical equipment and temporary wiring for electrical power or lighting shall comply with the applicable provisions of NFPA 70 and Sections 3106.6.1 through 3106.6.3.

3106.6.1 Outdoor use All electrical equipment and wiring shall be listed and labeled for outdoor use.

3106.6.2 Generators Generators shall be installed at least 10 feet (3048 mm) from combustible materials, and shall be isolated from the public by physical guard, fence, or enclosure installed at least 3 feet (914 mm) away from the internal combustion power source.

3106.6.3 Fire Extinguishers Each generator shall be provided with an approved portable fire extinguisher in accordance with Section 906.

Reason: This is the third proposal in a package of four Chapter 31 proposals submitted by the F-CAC to revise, update and reorganize Chapter 31. These four proposals are intended to improve the minimum level of safety relating to all types of temporary structures and outdoor public gatherings; improve the correlation of requirements in the IBC and IFC for temporary structures and better correlate the applicability of IBC structural requirements for all types of temporary tents, membrane structures and other outdoor structures. These proposals have been prepared by a F-CAC Work Group comprised of code officials, industry representatives and other stakeholders. The Work Group analyzed several fatal events related to outdoor public gatherings and structural failures in the development of these new code requirements to improve the authority of code officials to ensure public safety and create a
level playing field for the owners of tents, outdoor structures and the promoters of outdoor gatherings by providing a reasonable set of code requirements for these structures and events.

1. The Indiana State Fair stage collapse - August 13, 2011
2. Wood Dale Prairie Fest (Chicago area) – August 2, 2015

Specifically, this proposal:

1. Adds a new definition for “outdoor assembly event” which is needed to explain the types of outdoor gatherings intended to be regulated by the new Section 3106.
2. Adds a new requirement for an operational permit requirement to Chapter 1. This will give the fire code official the necessary authority to receive advanced plans and other required documentation to ensure the public safety and fire code compliance for outdoor assembly events.
3. Adds a new section for requirements pertaining to outdoor assembly events. This new section is needed to add requirements that provide a minimum level of public and firefighter safety at outdoor events attended by more than 1,000 people. Current requirements in Chapter 31 address outdoor temporary structures that are typically part of outdoor gatherings, but there are no current IFC requirements that address outdoor public gatherings in a comprehensive fashion that evaluates all aspects of public safety. This new section adds the necessary public safety requirements needed for outside public gatherings and requires a public safety plan that correlates to the current emergency planning and preparedness requirements in Chapter 4 of the IFC.

Occupancy and means of egress - ensures that adequate provisions are in place for normal and emergency egress of attendees at special outdoor events.

Public safety for events - ensures that emergency planning involves all the necessary stakeholders (such as the fire code official, site owner, event promoter and other public safety officials) and address the appropriate level of public safety planning based on an all-hazards and all-discipline approach.

Concession stands, food and merchandise booths - ensures a minimum level of safety requirements for fire and public safety of all types and sizes of concession stands.

Cooking appliances or devices - ensures a minimum level safety of temporary cooking operations and appliances and the hazards associated with temporary cooking such as fire and LP-gas storage and use.

Electrical equipment and wiring - ensures a minimum level of safety for electrical equipment, wiring, generators and generator fuel storage.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Cost Impact: Will increase the cost of construction
This code change proposal establishes minimum requirements for outdoor public assembly events and does not impact any construction requirements.
Committee Action: Disapproved

Committee Reason: This proposal was disapproved with several concerns. The first of these concerns relate to the difficulty in enforcing the cooking separations required by the proposal. It is typical for events to have rows of cooking within tents. Also there was confusion on the use of 1000 persons where Section 3105.5 uses 400 square feet. It was felt that Chapter 4 already addressed a public safety plan. It should be noted that the concepts addressed by this proposal in general were seen as useful.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Richard Nix, representing Self, Entertainment Services and Technology Association (ESTA), Event Safety Alliance (ESA) (rnix@zoomtown.com) requests Approve as Modified by this Public Comment.

Further Modify as Follows:

2015 International Fire Code

105.6.36 Outdoor assembly event An operational permit is required to conduct an outdoor assembly event where planned attendance exceeds 1000 persons. Application for said permit shall be made no less than ten days prior to the planned start date of the event.

3106.4.2 Weather monitoring person Where required by the fire code official, the event operator or agent shall designate one qualified individual to continuously monitor local weather reports, forecasts and conditions. Said person will be responsible to order the suspension or cancellation of the outdoor assembly event and issue the evacuation signal in accordance with the approved all-hazard safety and evacuation plan. The designated person shall be permitted to be a trained crowd manager.

3106.4.3 Crowd managers Where events involve a gathering of more than 1,000 people, trained crowd managers shall be provided in accordance with Section 403.12.3.

Commenter’s Reason:

1. This public comment supports the public comment F310 F-CAC Public Comment, with one basic exception: Lower the permit and trained crowd manager requirement thresholds for outdoor assemblies from 1,000 to 300. This public comment also adds clarification that a person designated to monitor weather may also be a trained crowd manager, thus allowing efficient use of personnel on smaller events. The proposed changes included in this public comment are intended to include all proposed changes per F310 F-CAC Public Comment, except as noted herein.

2. This public comment maintains the original intent of F310, and of the F310 F-CAC Public Comment.

3. Two notable incidents of tent collapse in 2015 resulted in death and injury: Wood Dale Illinois tent collapse (1 fatality, 20 injured), and New Hampshire Circus Tent collapse (2 fatalities, 22 injuries). Both events had an estimate attendance of well under 1,000 persons. The safety of both events would have been significantly enhanced by a requirement for public safety plans, including weather monitoring and trained crowd managers, the requirements for which are currently driven by the permit requirement threshold, and at Fire Code Official’s discretion. We believe that lowering the requirement threshold emphasizes the importance of collaborative safety in outdoor assembly events.

4. ROCAH states that the committee believes public safety plans are adequately addressed in Chapter 4. However, we maintain that Chapter 4 does not adequately stress the importance of public safety plans for outdoor events. The potential risks associated with outdoor events are inherently higher due to weather.

5. This public comment affirms the importance of enhancing safety by having designated person(s) responsible for weather monitoring. This public comment affirms the importance of having weather-related public safety plans in effect during outdoor events.

6. The concept of having a designated person, and of having a safety plan is supported by the normative requirements of ANSI E1.21-2013. This standard is already referenced by IFC Chapter 31, and mandates those requirements regardless of event size, structure size, or number of event attendees. Industry affirms that lowering the requirement thresholds are important, necessary and acceptable. Industry also cites a lack of education and a perception of inconsistent enforcement as contributory causes of decreased safety at outdoor events.
Proponent: Michael O’Brien representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

403.12.2 Public safety plan for gatherings. Where the fire code official determines that an indoor or outdoor gathering of persons has an adverse impact on public safety through diminished access to buildings, structures, fire hydrants and fire apparatus access roads or where such gatherings adversely affect public safety services of any kind, the fire code official shall have the authority to order the development of or prescribe a public safety plan that provides an approved level of public safety and addresses the following items:

1. Emergency vehicle ingress and egress.
2. Fire protection.
3. Emergency egress or escape routes.
4. Emergency medical services.
5. Public assembly areas.
6. The directing of both attendees and vehicles, including the parking of vehicles.
7. Vendor and food concession distribution.
8. The need for the presence of law enforcement.
9. The need for fire and emergency medical services personnel.
10. The need for a weather monitoring person.

3104.12 Portable fire extinguishers. Approved portable fire extinguishers complying with Section 906 shall be provided at each exit and other placed in locations as required by the fire code official.

105.6.36 Outdoor assembly event An operational permit is required to conduct an outdoor assembly event where planned attendance exceeds 1000 persons. Application for said permit shall be made no less than ten days prior to the planned start date of the event.

3106.2.3 Access An approved means of fire apparatus access roads shall be provided in accordance with Section 503.

3106.4.1 Public safety plan for gatherings A public safety plan shall be prepared in accordance with when required by section 403.12.2. The public safety plan shall be submitted for approval by the fire code official with the application for an operational permit as required by Section 3106.2.2

Exception: Where the fire code official determines that the nature of the outdoor assembly event does not pose an increased hazard to public safety.

3106.4.2 Weather monitoring person Where required by the fire code official, the event operator or agent shall designate one qualified individual to continuously monitor local weather reports, forecasts and conditions. Said person shall be responsible to initiate weather related event mitigation activities, order the suspension or cancellation of the outdoor assembly event and issue the evacuation signal in accordance with the approved all-hazard public safety and evacuation plan.

3106.4.4 Portable Fire Extinguishers Approved portable fire extinguishers shall be provided in accordance complying with Section 906 shall be provided and placed in locations approved by the fire code official.

3106.5.1 Public isolation Cooking appliances or devices shall be isolated from the public by not less than 4 feet (1219 mm) or by a non-combustible 3-sided barrier between the cooking appliances or devices and the public.

3106.6.3 Portable Fire Extinguishers Each generator shall be provided with an approved portable fire extinguisher in accordance complying with Section 906.

Commenter's Reason: This Public Comment addresses the concerns expressed by the Committee as their reasons for Disapproval.

1. Adding additional discretion to the fire code official as to when an outdoor assembly permit is required. The fire code official can require or waive the permit requirement based on whether or not the planned outdoor assembly event has the potential to affect public safety or emergency response. Added the weather monitoring person to the items required under the public safety plan requirements in Section 403.12.2.

2. Changes all sections relating to portable fire extinguishers to be consistent with current requirements and each section in Chapter 31 that has fire extinguisher requirements.

3. Changed fire apparatus “access” (Section 3106.2.3) to be more flexible

4. Removed requirement for the fire code official to approve all public safety plans; they now have administrative discretion as to reviewing said plans.
5. Modified the requirement for weather monitoring person to be required when deemed necessary by the fire code official.

6. Removed requirements for isolation or separation of cooking appliances, which the committee felt were overly restrictive and one of the primary reasons for Disapproval.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)
Committee Action: Approved as Submitted

Proposed Change as Submitted

Proponent : Michael O'Brien representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code

Revise as follows:

3209.4 Automated rack storage. *High-piled storage areas with greater than 500 square feet (46 m²) of automated rack storage shall be provided with a manually activated emergency shutdown switch for use by emergency personnel. The switch shall be clearly identified and shall be in a location approved by the fire chief.*

1. Automatic shutdown of the automated rack storage system shall occur when water flow is detected in the automatic sprinkler system, if present.
2. Automatic shutdown of the automated rack storage system shall occur upon activation of the fire detection system required in Table 3206.2, if present.
3. A manually activated switch shall be provided to shut down the automated rack storage system. The switch shall be clearly identified and shall be in a location approved by the fire chief.

Add new text as follows:

3209.4.1 Emergency operation. *Capability shall be provided for emergency personnel to override the shutdown and operate the rack storage system after shutdown has occurred. When the override is utilized, the automated rack storage system will travel at a speed approved by the fire chief.*

Reason: Automated rack storage systems typically consist of aisles which are only wide enough for the pallet load, and heights which reach above 75 feet. The pallet movers travel quickly from one end of the rack to the other, and from floor to topmost storage tier. If these pallet movers are operational when firefighters are within the storage array, there is very high possibility for injury since there is nowhere to escape the path of the pallet mover as it travels down the aisle. This process necessitates the need to clarify and enhance the requirements for shutdown and operation during a fire situation.

Similar to the requirements for carousel storage in Section 3209.3, a threshold is included for application of these shutdowns when the area exceeds 500 square feet. The functions of the required shutdowns are clarified. New requirements specify that shutdown is to occur automatically upon water flow or fire detection system operation. Additionally, the manual shutdown is retained.

Section 3209.4.1 is added to require that the system can be overridden to allow use by firefighters. Since many of these automated rack storage systems can exceed the reach of firefighting operations from the floor, the pallet movers can be used to carry firefighters up to locations within the rack for final extinguishment. The pallet movers are designed for this type of operation already, where they can transport personnel up into the rack for maintenance and inspection operations. This requirement allows the firefighters to utilize this same function after the automated rack storage system shutdown has activated. A requirement is included for the fire chief to review and approve the operating speed when the equipment is in manual override.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Cost Impact: Will increase the cost of construction

This may result in a minimal increase to the cost of construction. Automated storage is a computer controlled system, so revisions to the program software may be necessary along with a manual switch.

Public Hearing Results

Committee Action: Approved as Submitted
Committee Reason: Approval is based upon the proponent's published reason. It was noted that automatic shutdown is important for emergency operations in unmanned facilities.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

3209.4 Automated rack storage. *High-piled storage areas* with greater than 500 square feet (46 m²) of automated rack storage shall be provided with an approved shutdown capabilities as follows process. The shutdown process shall commence upon any of the following occurrences:

1. Automatic shutdown of the automated rack storage system shall occur when water flow is detected in the *automatic sprinkler system*, if present.
2. Automatic shutdown of the automated rack storage system shall occur upon activation of the *fire detection system* required in Table 3206.2, if present.
3. A manually activated switch shall be provided to initiate the shut down the automated rack storage system process. The switch shall be clearly identified and shall be in a location approved by the fire chief.

3209.4.1 Emergency operation Override. Capability shall be provided for emergency personnel to override the shutdown process and operate the rack storage system after shutdown has occurred. When the override is utilized, the automated rack storage system will travel at a speed approved by the fire chief.

3209.4.2 Emergency operation Where the automated rack storage system incorporates cranes to move full-sized pallet loads vertically through the rack array, each crane shall be capable of manual operation after shutdown has occurred for use by fire department personnel to access upper tiers of the rack system. Where manual operation is provided, the crane shall travel at a speed acceptable to the fire chief.

Commenter's Reason: This Public Comment is intended to clarify the requirements in two issues. First the language in Section 3209.4 is revised to required a shutdown process for the automated rack storage system rather than immediate shutdown. There are times where a phased shutdown will be appropriate, or may only be necessary for a portion (zone) of the facility. For example, assume a large facility with 10 fire sprinkler zones, and water flow is detected in Zone #1.

1. Automated movers in Zones 2-10 can complete their task and then return to their home base. This will allow those aisles to be empty of product loads that just stopped wherever they are located.
2. Automated movers in Zone 1 that are not carrying a load can return to their home base.
3. Automated movers in Zone 1 which are carry a load shall travel to the closest area out of the storage aisles. At that point, they shall stop so that they do not obstruct the aisle.

This is just an example of a possible shutdown process. The shutdown process can be specifically tailored to the facility, but still must meet the approval of the fire code official. The remainder of Section 3209.4 is revised to clarify that the shutdown process is initiated on any of the three conditions.

Second, Section 3209.4.1 is split into two sections to separate the requirements. In section 3209.4.1 the first sentence is retained with a revision to use the term “shutdown process” as described in 3209.4.

The second sentence in Section 3209.4.1 is relocated and rewritten in Section 3209.4.2. This provision is then clarified so this applies to rack storage systems, typically where cranes can move full-sized pallet loads vertically within the rack system. The application to pallet cranes is critical, as this section is intended to allow use by fire department personnel to gain access to upper loads in rack storage systems. Where cranes cannot accommodate a pallet load, they will likely not be able to accommodate a firefighter or two with PPE or hose equipment.

The pallet cranes are designed for these types of loads already. In many cases they have the potential to transport personnel up into the rack for maintenance and inspection operations. This requirement allows firefighters to utilize this same function after the automated rack storage system shutdown has activated. The requirement is retained for the fire chief to review and approve the operating speed when the equipment is in manual override.

The language in this PC was vetted in collaboration with the Fire Code Action Committee.
Proponent: Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com) requests Disapprove.

Commenter's Reason: This is not a one-sized fits all code change, in many cases and in many facilities this simply cannot work. Automated rack storage systems are already regulated by 3209.4 and have a manual shutdown switch requirement which would shut down the affected conveying system. Having all of the systems in an entire facility shut down on a false alarm is very costly to any facility using these types of systems, the manual system that is currently in place has been working with great success. In some situations it can take an operation over 12 hours to get back up and running after a false alarm. Shutting these down by water flow or fire alarm can make things worse for fire fighting capabilities, if the crane system is shut down they can and will in most cases actually block aisles that could be used for firefighting. In some of these facilities there are more than 500 robots carrying product with additional cranes operating, stopping this automation will create more of a hazard then allowing them to continue to run.

Section 3209.4.1 is also problematic, many of these systems are not large enough or have the capacity to carry a fire fighter in full gear. In addition, in the case of a fire alarm the building will be evacuated and it may be difficult to find the exact person who can run this equipment, how will the fire department know how to operate these sophisticated computerized systems? Some of these systems are only capable of certain speeds and may not be able to be altered, some are very slow, while others very fast.

Finally, the proponent has not provided any substantiating fire data that this change is needed and that the current language is not working as is.
F326-16
IFC: 3303.1.

Proposed Change as Submitted

Proponent: Jonathan Roberts (jonathan.roberts@ul.com)

2015 International Fire Code

Revise as follows:

3303.1 Listed. Temporary heating devices shall be listed and labeled in accordance with the International Mechanical Code or the International Fuel Gas Code. The installation, maintenance and use of temporary heating devices shall be in accordance with the terms of listing and the manufacturer's instructions.

Reason: The IMC and the IFGC do not regulate portable heating devices. Referencing these codes is not necessary. This code change will require the devices to be used in accordance with their listing and the manufacturer's instructions.

Cost Impact: Will not increase the cost of construction
The change simply clarifies existing requirements and revises the language within this section.

Public Hearing Results

Committee Action: Approved as Submitted
Committee Reason: This proposal was approved based upon the proponent's reason statement.
Assembly Action: None

Individual Consideration Agenda

Proponent: Ted Williams, representing American Gas Association (twilliams@aga.org) requests Disapprove.

Commenter's Reason: While the proponent is correct that the International Fuel Gas Code (IFGC) does not address "portable" heaters, such as those that can be used in occupied spaces, the coverage proposed for deletion addresses "temporary" heating such as construction heaters. Temporary heating can be provided by a wide variety of devices and not "portable heaters," per se, and construction heating is certainly covered by the IFGC.
**Proposed Change as Submitted**

Proponent: Michael O'Brian representing the Fire Code Action Committee (FCAC@iccsafe.org)

**2015 International Fire Code**

**3308.6.1 Smoke detectors and smoke alarms.** Smoke detectors and smoke alarms located in an area where airborne construction dust is expected shall be covered to prevent exposure to dust or shall be temporarily removed. During the time when smoke detectors or smoke alarms are out of service, an approved fire watch or other approved alternative means of detecting a fire shall be provided. Smoke detectors and alarms that were removed shall be replaced upon conclusion of dust-producing work. Smoke detectors and smoke alarms that were covered shall be inspected and cleaned, as necessary, upon conclusion of dust-producing work.

**Reason:** Unwanted alarms continue to negatively impact fire service resources. Construction activities such as welding, cutting, sanding and other dust producing operations, cause many unwanted alarms and unnecessary responses. When project planning, coordination and positive actions are taken before the construction activities, unwanted alarms can be drastically reduced.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

**Cost Impact:** Will not increase the cost of construction

This proposal merely trying to avoid unwanted alarms due to construction conditions associated with smoke alarms and smoke detectors.

**Public Hearing Results**

**Committee Action:** Approved as Modified

**Modification:**

**3308.6.1 Smoke detectors and smoke alarms.** Smoke detectors and smoke alarms located in an area where airborne construction dust is expected shall be covered to prevent exposure to dust or shall be temporarily removed. During the time when smoke detectors or smoke alarms are out of service, an approved fire watch or other approved alternative means of detecting a fire shall be provided. Smoke detectors and alarms that were removed shall be replaced upon conclusion of dust-producing work. Smoke detectors and smoke alarms that were covered shall be inspected and cleaned, as necessary, upon conclusion of dust-producing work.

**Committee Reason:** This new section is necessary as the owners responsibility provisions currently only require the removal of coverings on smoke detectors and alarms and don't address the need to provide such covers to avoid unwanted alarms. The modification removes the second sentence that would require a fire watch while the smoke alarms are out of service. This was seen as an unreasonable requirement.

**Assembly Motion:** Disapprove

**Online Vote Results:** Failed
Support: 25.51% (149) Oppose: 74.49% (435)

**Assembly Action:** None

**Individual Consideration Agenda**

Proponent: Billie Zidek, APPA, representing APPA requests Disapprove.
Commenter's Reason: This proposal was one of several that were not brought to the APPA I-Code Work Group's attention during our initial deliberations. It came to light later in the APPA Standards and Code Council (ASCC) and was added to the list to oppose because:

- There seems to be no latitude provided for varying situations. For example, if some smoke are bagged to avoid triggering a false alarm, but the remainder of the system including such things as pull stations, heat detectors, sprinkler flow switches, etc. are in full working order, is the expensive fire watch still warranted? The proposal allows for "other approved methods of detecting a fire" in lieu of a fire watch, but doesn't enumerate them. What if there is no occupancy in the building? If work is ongoing while the detectors are out of service, do the presence of the workers constitute a fire watch? We are in full agreement with measures to reduce false alarming, and requiring fire watches where the entire system or a substantial portion is down and the building is wholly or partially occupied, but consider requiring a fire watch over an entire building because some small component of it is temporarily out of service seems to be excessive.
Proposed Change as Submitted

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com)

2015 International Fire Code

Revise as follows:

3310.1 Required access. Approved vehicle access for fire fighting shall be provided to all construction or demolition sites. Vehicle access shall be provided to within 100 feet (30 480 mm) of temporary or permanent fire department connections. Vehicle access shall be provided by either temporary or permanent roads, capable of supporting vehicle loading under all weather conditions. Vehicle access shall be maintained until permanent fire apparatus access roads are available, in accordance with the following:

1. Within 100 feet (30 480 mm) of temporary or permanent fire department connections.
2. Within 150 feet on not less than two sides of a building being constructed where both of the following apply:
   2.1 Construction is utilizing combustible materials.
   2.2 Construction activities exceed two stories in height above grade other than detached one- and two-family dwellings and townhouses.

Add new text as follows:

3310.1.1 All weather access. Vehicle access shall be provided by either temporary or permanent roads, capable of supporting vehicle loading under all weather conditions. Vehicle access shall be maintained until permanent fire apparatus access roads are available.

Reason: The purpose of this proposal is two fold. The first objective was to split the language into two sections, leaving 3310.1 as the charging section for when access is required and creating a new 3310.1.1 for the carrying capability requirements for that access.

The current language calls for approved access to all construction or demolition sites, but does not provide any specific other than access within 100 feet of any FDCs. Construction is when a building is at its most vulnerable, particularly those utilizing combustible construction components. The fires, when they occur, are challenging and require access to effectively apply hose and master device streams.

The referenced standard, NFPA 241, includes the following requirement:

“7.5.5.7 The access roadway shall be extended to within 46 m (150 ft) of all portions of the exterior walls of the first story of any building.”

Recognizing that pulling that requirement into the code presents practical difficulties for the overwhelming majority of construction sites, the language suggested ties the access to only two sides and uses a trigger of over two stories in height of combustible construction methods as a more reasonable target for compliance.

Cost Impact: Will increase the cost of construction.

There could be some increased compliance by providing the required access, however, there will also be opportunities to save costs by having a standard of access in the code that designers and builders can utilize as they develop project plans instead of facing the unexpected need to modify operations to provide access once the site work starts.

Public Hearing Results

Committee Action: Disapproved

Committee Reason: This proposal was disapproved for several reasons. The requirements take away discretion from the fire code officials. Also, there was a concern that additional language was necessary from NFPA 241. Finally the proposal inappropriately penalizes combustible construction.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:
Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

3310.1 Required access. Approved vehicle access for fire fighting shall be provided to all construction or demolition sites. Vehicle access shall be provided in accordance with the following:

1. Within 100 feet (30 480 mm) of temporary or permanent fire department connections.
2. Within 150 feet on not less than two sides of a building being constructed where both of the following apply:
   1. Construction is utilizing combustible materials.
   2. Construction activities exceed two stories in height above grade other than detached one- and two-family dwellings and townhouses.
3. To provide access to buildings on construction or demolitions sites in accordance with NFPA 241, Section 7.5.5 where required by the fire code official.

Commenter's Reason: The intent of the original proposal was to provide additional guidance to the fire code official for requiring vehicle access to construction or demolition sites in addition to the guidance for fire department connections. The committee reason for disapproval was based on the following three points:

- The requirements take away discretion from the fire code officials.
- Also, there was a concern that additional language was necessary from NFPA 241.
- Finally the proposal inappropriately penalizes combustible construction.

To address these concerns the language is proposed to be modified by deleting the language in Item 2 and replacing that language with a pointer directly to Section 7.5.5 NFPA 241 which addresses vehicle access. Doing this addresses the concern that there is additional NFPA 241 language to apply including language that offers the fire code official and the site additional flexibility in providing the necessary access. It also adds the phrase, "when required by the fire code official". This replacement language no longer penalizes combustible construction and it provides the fire code official with flexibility as to requiring the access and how to address that need.

All of the committee concerns have been addressed by this modification.

For reference purposes following is the relevant language from NFPA 241.

NFPA 241-2013

7.5.5 Access Roadways.

7.5.5.1 Every building shall be accessible by fire department apparatus by means of roadways having an all-weather driving surface of not less than 6.1 m (20 ft) of unobstructed width, having the ability to withstand the live loads of fire apparatus, and having a minimum of 4.1 m (13 ft 6 in.) of vertical clearance.

7.5.5.2 Access for use of fire department apparatus shall be provided to the immediate job site at the start of the project and maintained until completion.

7.5.5.3 Dead-end fire department access roads in excess of 46 m (150 ft) in length shall be provided with approved provisions for turning around fire department apparatus unless otherwise permitted by 7.5.5.4.

7.5.5.4 The requirements of 7.5.5.1 through 7.5.5.3 shall be permitted to be modified where, in the opinion of the fire department, fire-fighting or rescue operations would not be impaired by such modification.

7.5.5.5 The required width of access roadways shall not be obstructed in any manner, including obstruction by parked vehicles.

7.5.5.6 "No Parking" signs or other appropriate notices, or both, prohibiting obstruction shall be permitted to be required and shall be maintained.

7.5.5.7 The access roadway shall be extended to within 46 m (150 ft) of all portions of the exterior walls of the first story of any building.

7.5.5.8 Where an access roadway cannot be provided, an approved fire protection system or systems shall be provided as required and approved by the authority having jurisdiction.

7.5.5.9 Where a bridge is required to be used as access, it shall be constructed and maintained using design live loading sufficient to carry the imposed loads of the fire apparatus.
Proposed Change as Submitted

Proponent: Stephen Skalko, representing Masonry Alliance for Codes and Standards (svskalko@cox.net)

2015 International Fire Code

Add new text as follows:

3314.2 (IBC [F] 3312.2, IEBC [F] 1507.2) Completion during construction Where an automatic sprinkler system is required by this code in buildings of Type III, IV and V construction, four or more stories in height, the portion of the building or structure that is more than 40-feet above fire department vehicle access shall not begin construction until the automatic sprinkler is operational for all stories below. Such automatic sprinkler system shall be extended as construction progresses to within one floor of the highest point of construction having secured decking or flooring.

Reason: Buildings built to larger heights and areas as allowed in Tables 504.3, 504.4 and 506.2 of the International Building Code are very dependent on automatic sprinkler protection systems. With these increases in building size there has been a notable increase in fires, especially for Group R2 Residential Occupancies constructed of combustible framing and while the building is under construction. This has resulted significant loss of property for the building under construction and nearby properties exposed to the fire in part because important fire safety features such as passive fire protection for the combustible framing is not complete and automatic sprinkler system upon which these larger and taller buildings depend have not been made operational.

Besides the damage to the building under construction and to nearby properties some of these fires have required major street closures including interstates, and tied up firefighting resources to the extent that other areas of the communities were left under-protected for extended periods. A recent example is a major fire in Los Angeles with five stories of wood framing over a two story concrete podium on December 8, 2014 that not only resulted in millions of dollars in damage to the building under construction, but also damaged adjacent buildings. The apartment building known as the DaVinci was a complete loss after the fire that was fueled by the five stories of wood frame construction. More than 250 firefighters were dispatched to the scene. The burning of the structure’s wooden frame forced the closure of northbound Harbor(110) Freeway and affected local streets causing major traffic disruptions for commuters and to the nearby business and residences. Buildings nearby were damaged by exposure to fire from the radiant heat as well as damage inside because the fire activated sprinklers in these adjacent buildings. It has been reported that the heat also melted or damaged computers and partition cubicles in neighboring building as well. The glazing in hundreds of windows of a nearby building was also damaged.

Besides this DaVinci fire other recent large combustible framed buildings under construction that had fires that illustrate the risk of exposed combustible framing without operational sprinkler systems and presented significant challenges for the fire service include:

**Project Name / Location:** Lindell Avenue Apartments, St. Louis, MO  
**Date of Incidents:** June 13, 2007 and July 18, 2012  
**Project Description:** 4 story, 197-unit, wood framed apartment building.  
**Building Status:** Completed and occupied.  
This same wood framed building was also the scene of a 2007 fire that caused $12 million in damage while construction was underway.

**Project Name / Location:** 550 East and 500 South, Salt Lake City, UT  
**Date of Incident:** February 9, 2014  
**Project Description:** 4 story, wood frame apartment complex  
**Building Status:** Under construction  
The fire caused $2.5 million in damage.

**Project Name / Location:** Axis Apartments, Houston, TX  
**Date of Incident:** March 25, 2014  
**Project Description:** 5 story, 396 unit wood-framed apartment building  
**Building Status:** Under construction
The fire incident began as a 3-alarm fire at 12:30 p.m. but was upgraded to a 5-alarm in less than an hour. More than 400 Houston Fire Department personnel responded.

Project Name / Location: Apollo Way, Madison, WI
Date of Incident: August 8, 2014
Project Description: 4 story, 105-unit wood-frame apartment complex.
Building Status: Under construction
Authorities initially said the fire caused $3.5 million to $5 million in damage, but later the insurer estimated that damage is "upwards of $10 million."

Section 3311.1 of this code requires operational standpipes be in place when portions of buildings requiring standpipes are 40 feet or more above the lowest level of fire department vehicle access. This proposal takes a similar approach to the standpipe requirement for fire safety by requiring the sprinkler systems that are necessary to build these taller and larger buildings of combustible construction be operational when the construction reaches the 40 foot height above the fire department vehicle access. Too, like the standpipe requirements, the sprinkler system must be extended as each floor is provided with decking or flooring.

Cost Impact: Will increase the cost of construction
This proposal is expected to increase the cost of construction due to the sprinkler protection system having to be completed on lower floors before construction can begin higher up in the building. This increased cost however is necessary to reduce the risk of damage to adjacent properties due to fire exposure which results in economic hardship for repairs and disruption to businesses and residences, to minimize the impact to the public from traffic disruptions due to the size of the conflagrations, and to reduce the demand for fire service response due to these larger taller combustible framed buildings while under construction.

Committee Reason: This proposal was disapproved as it is overly restrictive and the requirements would be difficult to meet. There is often no underground service at this time of construction. This may force a contractor to violate NFPA 13 to comply. Other safety measures are available.

Committee Action: Disapproved

Commenter's Reason: In the Committee reason for disapproval they state "there is often no underground service at this time of construction". However, nothing is this proposed code change states that the automatic sprinkler system has to be connected to an underground service. The proposal would expect the water supply for the sprinkler system to comply with NFPA 13. Section 24.2.1(1) in the 2015-edition of NFPA 13 recognizes that sprinkler systems can be connected to an "approved" public or private waterworks system. It does not state that this supply must be underground, only that it be approved. Further, Section 3312.1 of the International Fire Code requires an "approved" water supply for fire protection be available as soon as combustible materials arrive on site. Thus, regardless of Type of Construction, buildings using combustible materials must have an approved water supply in the early stages of the building construction. And, NFPA 13 will permit the sprinkler protection system to be connected to this "approved" water supply. Thus, this proposed sprinkler system for buildings of Type III, IV and V construction four or more stories and when the construction is over 40-feet in height should already have an approved water supply for the contractor to connect to and NOT VIOLATE NFPA 13.

The Committee reason for disapproval also suggests the proposal is "overly restrictive". The incidences of fire in buildings of
F336-16

The use of combustible types of construction during the building phase have been increasing in recent years. The Reason statement in the original proposal documented five complexes that burned in 2014 and 2015. This proposal recognizes this higher risk of fires in buildings of this type during construction and proposes that the sprinkler protection be activated when the construction progresses over 40-feet. Placing more stringent requirements in the code to address an issue, such as this case of fire incidences, is historically how the building code has evolved over the years. Building in high seismic or wind regions require more stringent structural requirements to accommodate these events based on damage from previous incidences. Building with materials susceptible to higher fire risk necessitates more stringent fire safety requirements.

Finally, the Committee stated the provisions "would be difficult to meet". Though the requirement to have an active sprinkler protection system in place while construction is ongoing is more difficult, the difficulty is predicated on design decisions made when Types III, IV and V construction are chosen for the buildings. The higher risk of fires in buildings of this type during construction, as noted in the incidences cited, dictate these more stringent requirements.

Recommend approval as submitted.
Add new text as follows:

**CHAPTER 38 MARIJUANA PROCESSING AND EXTRACTION FACILITIES**

**SECTION 3801 GENERAL**

3801.1 Scope Marijuana processing or extraction facilities shall comply with this chapter and the International Building Code. The extraction process includes the act of extraction of the oils and fats by use of a solvent, desolventizing of the raw material and production of the miscella, distillation of the solvent from the miscella and solvent recovery. The use, storage, transfilling, and handling of hazardous materials in these facilities shall comply with this chapter, other applicable provisions of this code and the International Building Code.

3801.2 Existing buildings or facilities. Existing buildings or facilities used for the processing of marijuana or where the medium of extraction or solvent is changed shall comply with this chapter.

3801.3 Permits. Permits shall be required as set forth in Section 105.6 and 105.7.

**SECTION 3802 DEFINITIONS**

3802.1 Definitions The following terms are defined in Chapter 2:

- MARIJUANA EXTRACTION FACILITY (MEF)
- MARIJUANA EXTRACTION EQUIPMENT (MEE)
- MARIJUANA EXTRACTION ROOM (MER)
- DESOLVENTIZING
- MISCELLA

**SECTION 3803 PROCESSING AND EXTRACTION OF MARIJUANA**

3803.1 Construction. Marijuana processing shall be located in a building complying with the International Building Code.

3803.2 Prohibited occupancies. Marijuana extraction processes utilizing flammable gasses or flammable cryogenic fluids shall not be located in any building containing a Group A, E, I or R occupancy.

3803.3 Location. The extraction equipment and extraction process shall be located in a room dedicated to extraction.

3803.4 Staffing. The extraction process shall be continuously staffed by personnel trained in the extraction process, the use and hazards of hazardous materials and all emergency procedures. All staff training records shall be maintained on-site by the owner and made available upon request from the fire code official.

3803.5 Post-process purification and winterization. Post-processing and winterization involving the heating or pressurizing of the miscella to other than normal pressure or temperature shall be approved and performed in an appliance listed for such use. Domestic or commercial cooking appliances shall not be used.

3803.5.1 Industrial ovens. The use of industrial ovens shall comply with Chapter 30.

3803.6 Use of flammable and combustible liquids. The use of flammable and combustible liquids for liquid extraction processes where the liquid is boiled, distilled, or evaporated shall be located within a hazardous exhaust fume hood, rated for exhausting flammable vapors. Electrical equipment used within the hazardous exhaust fume hood shall be rated for use in flammable atmospheres. Heating of flammable or combustible liquids over an open flame is prohibited.

**Exception:** The use of a heating element not rated for flammable atmospheres approved where documentation from the manufacture or approved testing laboratory indicates is it rated for heating of flammable liquids.

3803.7 Liquefied Petroleum Gas. Liquefied-petroleum gases shall not be released to the atmosphere.

**Exception:** LPG gas may be released to the atmosphere in accordance with NFPA 58 Section 7.3.

**SECTION 3804 SYSTEMS AND EQUIPMENT**

3804.1 General requirements. Systems and equipment used with the processing and extraction of marijuana shall comply with Sections 3804.2 through 3804.4, 5003.2, other applicable provisions of this code, the International Building Code, and the International Mechanical Code.
3804.2 Systems and equipment. Systems or equipment used for the extraction of marijuana and cannabis oils from plant material shall be listed or approved for the specific use. If the system used for extraction of marijuana and cannabis oils and products from plant material is not listed, then the system shall be reviewed by a Registered Design Professional. The Registered Design Professional shall review and consider any information provided by the system’s designer or manufacturer. For systems and equipment not listed for the specific use, a technical report in accordance with Section 3804.3 shall be prepared and submitted to the fire code official for review and approval. The firm or individual preparing the technical report shall be approved by the fire code official prior to performing the analysis.

3804.3 Technical report. The technical report which has been reviewed and approved by the fire code official, as required by Section 3804.2 is required prior to the equipment being located or installed at the facility. The report shall be prepared by a Registered Design Professional or other professional approved by the fire code official.

3804.3.1 Report Content. The technical report shall contain all of the following:
1. Manufacturer information.
2. Preparer of record on technical report.
3. Date of review and report revision history.
4. Signature page shall include all of the following:
   4.1 Author of the report.
   4.2 Date of report.
   4.3 Date and signature of Registered Design professional of record performing the design or peer review.
5. Model number of the item evaluated. If the equipment is provided with a serial number, the serial number shall be included for verification at time of site inspection.
6. Methodology of the design or peer review process used to determine minimum safety requirements. Methodology shall consider the basis of design, and shall include a code analysis and code path to demonstrate the reason as to why specific code or standards are applicable or not.
7. Equipment description. A list of every component and sub-assembly (fittings, hose, quick disconnects, gauges, site glass, gaskets, valves, pumps, vessels, containers, switches, etc.) of the system or equipment, indicating the manufacturer, model number, material, and solvent compatibility. Manufacturer’ data sheets shall be provided.
8. A general flow schematic or general process flow diagram of the process. Post-processing or winterization may be included in this diagram. All primary components of the process equipment shall be identified and match the equipment list required in Item 7. Operating temperatures, pressures, and solvent state of matter shall be identified in each primary step or component. A piping and instrumentation diagram (PID or PI&D) shall be provided.
9. Analysis of the vessel(s) if pressurized beyond standard atmospheric pressure. Analysis shall include purchased and fabricated components.
10. Structural analysis for the frame system supporting the equipment.
11. Process safety analysis of the extraction system, from the introduction of raw product to the end of the extraction process.
12. Comprehensive process hazard analysis considering failure modes and points of failure throughout the process. The process hazard analysis shall include a review of emergency procedure information provided by the manufacturer of the equipment or process and not that of the facility, building or room.
13. Review of the assembly instructions, operational and maintenance manuals provided by the manufacturer.
14. List of references used in the analysis.

3804.4 Site inspection. Prior to operation of the extraction equipment, where required by the fire code official, the engineer of record or approved professional, as approved in 3805.2 shall inspect the site of the extraction process once equipment has been installed for compliance with the technical report and the building analysis. The engineer of record or approved professional shall provide a report of findings and observations of the site inspection to the fire code official prior to the approval of the extraction process. The field inspection report authored by engineer of record shall include the serial number of the equipment used in the process and shall confirm the equipment installed is the same model and type of equipment identified in the technical report.

SECTION 3805 SAFETY SYSTEMS

3805.1 Gas detection. For extraction processes utilizing flammable gases as solvents, a continuous gas detection system shall be provided. The gas detection threshold shall be no greater than 25% of the LEL/LFL limit of the materials.

3805.1.1 System design. The flammable gas detection system shall be listed or approved and shall be calibrated to the types of fuels or gases used for the extraction process. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL).

3805.1.2 Gas detection system components. Gas detection system control units shall be listed and labeled in accordance with UL 864 or UL 2017. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and
vapors being detected.

3805.1.3 Operation. Activation of the gas detection system shall result in all the following:

1. Initiation of distinct audible and visual alarm signals in the extraction room.
2. Deactivation of all heating systems located in the extraction room.
3. Activation of the mechanical ventilation system, where the system is interlocked with gas detection.

3805.1.4 Failure of the gas detection system. Failure of the gas detection system shall result in the deactivation of the heating system, activation of the mechanical ventilation system where the system is interlocked with the gas detection system and cause a trouble signal to sound in an approved location.

3805.1.5 Interlocks. All electrical components within the extraction room shall be interlocked with the gas detection system. Activation of the gas detection system shall disable all light switches and electrical outlets.

3805.2 Emergency shut off. Extraction processes utilizing gaseous hydro-carbon based solvents shall be provided with emergency shut off systems in accordance with Section 5803.1.3.

105.6.49 Marijuana extraction systems. An operational permit is required to use a marijuana/cannabis extraction systems.

105.7.19 Marijuana extraction systems. A construction permit is required for installation of or modification to a marijuana/cannabis extraction systems. Maintenance performed in accordance with this code is not considered to be modification and does not require a construction permit.

SECTION 202 DEFINITIONS

DESOLVENTIZING The act of removing a solvent from a material.

MARIJUANA EXTRACTION EQUIPMENT (MEE) Equipment or appliances used for the extraction of botanical material such as essential oils, from marijuana.

MARIJUANA EXTRACTION FACILITY (MEF) A building used for the solvent-based extraction process of marijuana.

MARIJUANA EXTRACTION ROOM (MER) The room or space in which the solvent-based extractions occur.

MISCELLA A mixture, in any proportion, of the extracted oil or fat and the extracting solvent.

Reason: This proposal is established to provide regulatory guidance to marijuana extraction facilities. This new industry legal is severla states produces marijuana for sale in specially stores. At this time there are no specific regulations in place to ensure safety in the extraction facilities. This proposal will establish specific requirements for handling hazardous materials, establish inspection standards and provide construction and permit requirements to ensure the life/safety of occupuants, fire reponders and the general public. One of the biggest items this proposal covers and assist with is the fact that there is no listed equipement for the these types of processess and this proposal gives the jurisdiction some guidance on how to deal with that issue.

This proposal provides operational and construction permit requirements for marijuana extraction. Marijuana extraction can involve explosive materials and dangerous process that pose serious risks to public health, safety and welfare, as illustrated by the 2013 explosion, fire and fatality in Bellevue and Spokane, WA. This proposal provides administrative direction, establish definitions, create requirements for risk analysis reports and inspections, identify construction requirements and electrical systems, and direct other administrative oversight to protect public safety. Given the serious risks posed by activities regulated by this rule, observing permanent rule timing requirements would be contrary to the public interest.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls,
Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Cost Impact: Will not increase the cost of construction
This has to do with a process issue and will not increase the cost of construction.

Committee Action: Disapproved
Committee Reason: This proposal was disapproved as the chapter should not be specific to marijuana. Other plants undergo the same processes and should be included if such a chapter is provided. In addition issues such as CO₂ enrichment should be specifically addressed within the new chapter.

Assembly Motion: As Modified
Online Vote Results: Successful
Support: 63.2% (225) Oppose: 36.8% (131)
Assembly Action: Approved as Modified

Online Floor Modification:

3805.1 Gas detection system. For Rooms in which extraction processes utilizing flammable gases as solvents, are conducted shall be provided with a continuous gas detection system that complies with Section 916. The gas detection system shall be designed to activate when the level of flammable gas detection threshold shall be no greater than exceeds 25% percent of the LEL/LFL lower flammable limit of the materials (LFL).

3805.1.1 System design. The flammable gas detection system shall be listed or approved and shall be calibrated to the types of fuels or gases used for the extraction process. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL).

3805.1.2 Gas detection system components. Gas detection system control units shall be listed and labeled in accordance with UL 864 or UL 2017. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and vapors being detected.

3805.1.3 3805.1.1 Operation. No change to text.

3805.1.4 3805.1.2 Failure of the gas detection system. No change to text.

3805.1.5 3805.1.3 Interlocks. No change to text.

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code
CHAPTER 38 MARIJUANA PLANT PROCESSING AND EXTRACTION FACILITIES

3801.1 Scope. Plant processing or extraction facilities shall comply with this chapter and the International Building Code. The extraction process includes the act of extraction of the oils and fats by use of a solvent, desolventizing of the raw material and production of the miscella, distillation of the solvent from the miscella and solvent recovery. The use, storage, transfiling, and handling of hazardous materials in these facilities shall comply with this chapter, other applicable provisions of this code and the International Building Code.
3801.2 Existing buildings or facilities. Existing buildings or facilities used for the processing of marijuana plants or where the medium of extraction or solvent is changed shall comply with this chapter.

3802.1 Definitions The following terms are defined in Chapter 2:

- MARIJUANA EXTRACTION FACILITY (MEF)
- MARIJUANA EXTRACTION EQUIPMENT (MEE)
- MARIJUANA EXTRACTION ROOM (MER)
- DESOLVENTIZING
- MISCELLA

3803.1 Construction. Marijuana processing shall be located in a building complying with the International Building Code.

3803.2 Prohibited occupancies. Marijuana extraction processes utilizing flammable gases or flammable cryogenic fluids shall not be located in any building containing a Group A, E, I or R occupancy.

3803.3 Location. The extraction equipment and extraction process utilizing hydrocarbon solvents shall be located in a room or area dedicated to extraction.

3803.4 Staffing. The extraction process shall be continuously staffed by personnel trained in the extraction process, the use and hazards of hazardous materials and all emergency procedures. All staff training records shall be maintained on site by the owner and made available upon request from the fire code official.

3804.1 General requirements. Systems and equipment used with the processing and extraction of marijuana oils and products from plants shall comply with Sections 3804.2 through 3804.4, 5003.2, other applicable provisions of this code, the International Building Code, and the International Mechanical Code.

3804.2 Systems and equipment. Systems or equipment used for the extraction of marijuana and cannabis oils from plant material shall be listed or approved for the specific use. If the system used for extraction of marijuana and cannabis oils and products from plant material is not listed, then the system shall be reviewed by a Registered Design Professional. The Registered Design Professional shall review and consider any information provided by the system’s designer or manufacturer. For systems and equipment not listed for the specific use, a technical report in accordance with Section 3804.3 shall be prepared and submitted to the fire code official for review and approval. The firm or individual preparing the technical report shall be approved by the fire code official prior to performing the analysis.

105.6.49 Marijuana Plant extraction systems. An operational permit is required to use a marijuana/cannabis plant extraction system.

105.7.19 Marijuana Plant extraction systems. A construction permit is required for installation of or modification to a marijuana/cannabis plant extraction systems. Maintenance performed in accordance with this code is not considered to be modification and does not require a construction permit.

SECTION 202 MARIJUANA EXTRACTION ROOM (MER)

The room or space in which the solvent-based extractions occur.

SECTION 202 MARIJUANA EXTRACTION FACILITY (MEF)

A building used for the solvent-based extraction process of marijuana.

SECTION 202 MARIJUANA EXTRACTION EQUIPMENT (MEE)

Equipment or appliances used for the extraction of botanical material such as essential oils, from marijuana.

Commenter’s Reason: This PC addresses a concern that this new chapter should not strictly focus on marijuana but is applicable to other processing and extraction processes with plants such as lavender and mint. There was no reason it should be limited to one type of plant and the specific references are removed by this public comment. Working with the industry we also made another change and deleted the staffing section from the original proposal, as there is no other location in the code were the fire department requires staffing for a process. The other change was to only require the use of hydrocarbon solvents in a decisted extraction room or area.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)
Proponent: Michael O'Brian representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by Successful Assembly Action.

3805.1 Gas detection system. For Rooms in which extraction processes utilizing flammable gases as solvents are conducted shall be provided with a continuous gas detection system that complies with Section 916. The gas detection system shall be provided. The designed to activate when the level of flammable gas detection threshold shall be no greater than exceeds 25% percent of the LEL/LFL lower flammable limit of the materials (LFL).

3805.1.1 System design. The flammable gas detection system shall be listed or approved and shall be calibrated to the types of fuels or gases used for the extraction process. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25% percent of the lower flammable limit (LFL).

3805.1.2 Gas detection system components. Gas detection system control units shall be listed and labeled in accordance with UL 864 or UL 2017. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and vapors being detected.

3805.1.3 Operation. No change to text.

3805.1.4 Failure of the gas detection system. No change to text.

3805.1.5 Interlocks. No change to text.

Commenter's Reason: The reason for the public comment is to emphasize that the floor motion for as modified addresses all the concerns and changes identified by the Fire Code committee and the comments made from the floor. There is a separate PC that addresses the concerns of the use of the term marijuana. One issue not addressed by this proposal is CO2 enrichment. Such systems are covered by F372-16 (AS). F372-16 was Approved as submitted and supported by the FCAC. This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Proponent: Assembly Motion requests Approve as Modified by Committee.

Commenter's Reason: This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly motion. The assembly action for Approve as Modified was Successful by a vote of 63.2% (225) to 36.8% (131) by eligible members online during the period of May 11 - May 26, 2016.

F338-16
Proposed Change as Submitted

Proponent: Michael O'Brian representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code

Add new text as follows:

CHAPTER 38 HIGHER EDUCATION LABORATORIES

SECTION 3801 GENERAL

3801.1 Scope. Laboratories in Group B occupancies used for educational purposes above the 12th grade complying with the requirements of this chapter shall be permitted to exceed the maximum allowable quantities of hazardous materials in control areas set forth in Chapter 50 without requiring classification as a Group H occupancy. Except as specified in this chapter, such laboratories shall comply with all applicable provisions of this code and the Building Code. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.

3801.2 Application. The provisions of this chapter shall be applied as exceptions or additions to applicable requirements of this code. Unless specifically modified by this chapter, the storage, use and handling of hazardous materials shall comply with all other provisions in Chapters 50 through 67 and the International Building Code for quantities not exceeding the maximum allowable quantity.

SECTION 3802 DEFINITIONS

3802.1 Definitions. The following terms are defined in Chapter 2:

CHEMICAL FUME HOOD
GLOVE BOX
LABORATORY SUITE
SPECIAL EXPERT

SECTION 3803 GENERAL SAFETY PROVISIONS

3803.1 Scope. Laboratories and laboratory suites applying the requirements of this chapter shall be in accordance with the general safety provisions in Sections 3803.1.1 through 3803.2.2.

3803.1.1 Chemical Safety Reviews. Operating and emergency procedures planning and documentation shall be provided in accordance with Sections 5001.3.3.11 through 5001.3.3.17. Such documentation shall be prepared by laboratory safety personnel or special experts, and shall be made available in the workplace for reference and review by employees. Copies of such documentation shall be made available to the fire code official for review upon request.

3803.1.2 Chemical handling. Receiving, transporting on site, unpacking and dispensing of hazardous materials shall be carried out by persons trained in proper handling of such materials and shall be performed in accordance with Chapters 50 through 67, as applicable.

3803.1.3 Warning Signage. Warning signs shall be provided in accordance with Section 5003.5.

3803.1.4 Maintenance of equipment, machinery and processes. Maintenance of equipment, machinery and processes used with hazardous materials shall comply with Section 5003.2.6.

3803.1.5 Time sensitive materials. Containers of materials that have the potential to become hazardous during prolonged storage shall be dated when first opened, and shall be managed in accordance with NFPA 45 Section 8.2.4.4.1.

3803.1.6 Hazardous Wastes. Storage, dispensing, use and handling of hazardous waste shall comply with this chapter and Chapters 50 through 67, as applicable.

3803.1.7 Ventilation. Ventilation for laboratories and laboratory equipment shall be designed and installed in accordance with the requirements in the International Mechanical Code and Chapter 7, NFPA 45.

3803.1.8 Automatic Fire Extinguishing Systems. New laboratories in new or existing buildings that increase maximum allowable quantities of hazardous materials based upon the requirements in this chapter shall be equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

3803.2 Hazardous materials storage and use. Hazardous Materials storage, handling and use in laboratories and laboratory suites complying with Chapter 38 shall be in accordance with this chapter and Chapters 50 through 67.
3803.2.1 Container Size. The maximum container size for all hazardous materials shall be 5.3 gallons for liquids, 50 pounds for solids, 100 cf. for health hazard gases per table 5003.1.1(2) and 500 cf. for all other gases in accordance with Table 5003.1.1(1).

Exception: Hazardous waste collection containers, for other than Class I and Class II flammable liquids, are permitted to exceed 5.3 (20L) gallons where approved.

3803.2.2 Density. Quantities of Class I flammable liquids in storage and use shall not exceed 8 gallons per 100 sf of floor areas. Densities shall be reduced by 25% on the 4th through 6th floors of the building and by 50% above the 6th floor. Regardless of the density, the maximum allowable quantity per control area or laboratory suite in accordance with this chapter, shall not be exceeded.

Exception: Designated hazardous waste collection areas or rooms within a laboratory suite or control area are not limited, but but such materials shall not exceed the maximum allowable quantity per laboratory suite or control area.

SECTION 3804 LABORATORY SUITE CONSTRUCTION

3804.1 General. Where laboratory suites are provided, they shall be constructed in accordance with this chapter, and Section 427 of the International Building Code.

3804.1.1 Laboratory Suites. The number of control areas and percentage of maximum allowable quantities of hazardous materials in laboratory suites shall be in accordance with Table 3804.1.1.

### TABLE 3804.1.1 DESIGN AND NUMBER OF LABORATORY SUITES PER FLOOR

<table>
<thead>
<tr>
<th>FLOOR LEVEL</th>
<th>PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER LAB SUITE</th>
<th>NUMBER OF LAB SUITES PER FLOOR</th>
<th>FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above Grade Plane 21+</td>
<td>25%</td>
<td>Not allowed</td>
<td>Not Allowed</td>
</tr>
<tr>
<td>Above Grade Plane 16-20</td>
<td>50%</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Above Grade Plane 11-15</td>
<td>75%</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Above Grade Plane 7-10</td>
<td>100%</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Above Grade Plane 4-6</td>
<td>Not allowed</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Above Grade Plane 3</td>
<td>Not allowed</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Above Grade Plane 1-2</td>
<td>Not allowed</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Below Grade Plane 1</td>
<td>75%</td>
<td>Not allowed</td>
<td>Not Allowed</td>
</tr>
<tr>
<td>Below Grade Plane Lower than 2</td>
<td>50%</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 5003.1.1(1) and 5003.1.1(2), with all increases allowed in the footnotes to those tables.

b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.

c. Vertical fire barriers separating laboratory suites from other spaces on the same floor may be one hour rated.

3804.1.1.1 Separation from other non-laboratory areas. Laboratory suites shall be separated from other portions of the building in accordance with the most restrictive of the following:

1. Table 3804.1.1 with fire barriers constructed in accordance with Section 707 of the International Building Code and horizontal assemblies constructed in accordance with Section 711 of the International Building Code.

   Exception: Where an individual laboratory suite occupies more than one story, the fire resistance rating of intermediate floors contained within the laboratory suite shall comply with the requirements of the International Building Code.


3804.1.1.2 Separation from other Laboratory Suites. Laboratory suites shall be separated from other laboratory suites in accordance with Table 3804.1.1.

3804.1.1.3 Floor Assembly Fire Resistance. The floor assembly supporting the laboratory suite and the construction supporting the floor of the laboratory suite shall have a fire resistance rating of not less than 2 hours.

   Exception: The floor assembly of the laboratory suite and the construction supporting the floor of the laboratory suite are allowed to be 1-hour fire resistance rated in buildings of Types IIA, IIIA and VA construction, provided that the building is 3 or fewer stories.

3804.1.1.4 Maximum number. The maximum number of laboratory suites shall be in accordance with Table 3804.1.1.

Where a building contains both laboratory suites and control areas, the total number of laboratory suites and control areas within a building shall not exceed the maximum number of laboratory suites in accordance with Table 3804.1.1.

3804.1.1.5 Means of Egress. Means of egress shall be in accordance with Chapter 10.
Standby or emergency power. Standby or emergency power shall be provided in accordance with Section 5004.7 where laboratory suites are located above the sixth story above grade plane or located in a story below grade plane.

Ventilation. Ventilation shall be in accordance with Chapter 7 of NFPA 45, and the International Mechanical Code.

Liquid tight floor. Portions of the laboratory suite where hazardous materials are present shall be provided with a liquid tight floor.

Automatic fire extinguishing systems. Buildings shall be equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

The percentage of maximum allowable quantities in each laboratory suite shall be in accordance with Table 3804.1.1.

SECTION 3805 NON-SPRINKLERED LABORATORIES

Scope. Storage and use of hazardous materials in existing laboratories located within existing buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, is permitted where such use complies with Section 3803, and with Chapters 50 through 67, as applicable, and Sections 3805.2 through 3805.4.

Non-sprinklered laboratories. The maximum allowable quantities of hazardous materials in storage and use in control areas in laboratories located in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall be in accordance with Table 5003.1.1(1) and 5003.1.1(2), and Table 5003.8.3.2, except as modified by Sections 3805.2.1 and 3805.2.2.

Restricted Materials Storage. Storage of hazardous materials prohibited by Table 5003.1.1 in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, shall be allowed within a laboratory at 25% of Table 5003.1.1 limits for a building equipped throughout with an automatic sprinkler system, with no additional increases allowed, provided that all such materials are stored in accordance with all of the following:

1. Containers shall be completely sealed and stored according to the manufacturer's recommendations.
2. Storage shall be within approved hazardous materials storage cabinets in accordance with Section 5003.8.7, or shall be located in an inert atmosphere glove box in accordance with NFPA 45 Section 7.11.
3. The storage cabinet or glove box shall not contain any storage of incompatible materials.

Restricted materials use. Use of hazardous materials prohibited by Table 5003.1.1 in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, shall be allowed within a laboratory at 25% of Table 5003.1.1 limits for buildings equipped throughout with an automatic sprinkler system, with no additional increases allowed, provided that all such materials are used in accordance with all of the following:

1. Use shall be within an approved chemical fume hood listed in accordance with UL 1805, or in an inert atmosphere glove box in accordance with NFPA 45 Section 7.11, or other approved equipment designed for the specific hazard of the material.
2. Combustible materials shall be kept at least 0.610 m (2 ft.) away from the work area, except for those items directly related to the research.
3. A portable fire extinguisher appropriate for the specific material shall be provided within 20 feet of the use in accordance with Section 906.

Restricted materials automatic fire detection. An automatic fire detection system shall be installed in all existing laboratories in non-sprinklered buildings in accordance with this section. Detectors shall be connected to the building's fire alarm control unit where a fire alarm system is provided. Detector initiation shall activate the occupant notification system in accordance with Section 907.5 where connected to the building's fire alarm control unit. Activation of the detection system shall sound a local alarm in buildings not equipped with a fire alarm notification system.

System supervision and monitoring. Automatic fire detection systems shall be electronically supervised and monitored by an approved supervising station or, where approved, shall initiate an audible and visual signal at a constantly attended on-site location.

Percentage of maximum allowable quantity per control area. The percentage of maximum allowable quantities per control area shall be permitted to be increased in accordance with Table 3805.4.

<table>
<thead>
<tr>
<th>TABLE 3805.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESIGN AND NUMBER OF CONTROL AREAS IN EXISTING NON-SPRINKLERED LABORATORIES</td>
</tr>
<tr>
<td>FLOOR LEVEL</td>
</tr>
</tbody>
</table>

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a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 5003.1.1(1) and 5003.1.1(2), excluding all increases allowed in the footnotes to those tables.

b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.

c. Vertical fire barriers separating control areas from other spaces on the same floor shall be permitted to be one hour rated.

d. See International Building Code Section 414.2.4 for additional requirements.

**SECTION 3806 EXISTING SPRINKLERED LABORATORIES**

**3806.1 Scope.** Storage and use of hazardous materials in new and existing laboratories in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, shall be in accordance with Section 3803, and with Chapters 50-67 as applicable, except as modified by this section.

**3806.2 Hazardous materials storage and use.** Storage and use of hazardous materials within control areas in new and existing sprinklered laboratories shall be in accordance with this section and Chapters 50 through 67, as applicable.

**Exception:** Existing laboratories in buildings equipped with an automatic sprinkler meeting requirements for laboratory suites are permitted to comply with Section 3804.

**3806.2.1 Percentage of maximum allowable quantity per control area.** The percentage of maximum allowable quantities per control area shall be in accordance with Table 3806.2.1.

### TABLE 3806.2.1

<table>
<thead>
<tr>
<th>FLOOR LEVEL</th>
<th>PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA</th>
<th>NUMBER OF CONTROL AREAS PER FLOOR</th>
<th>FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above Grade Plane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21+ 11-20</td>
<td>5% 10% 25% 50% 75% 100%</td>
<td>1 2 2 2 2 2</td>
<td>2 2 2 2 2 2</td>
</tr>
<tr>
<td>7-10 4-6 3 1-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below Grade Plane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 2 Lower than 2</td>
<td>100% 75% Not allowed</td>
<td>3 2 Not Allowed</td>
<td>1 1</td>
</tr>
</tbody>
</table>

a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 5003.1.1(1) and 5003.1.1(2), with all increases allowed in the footnotes to those tables.

b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building. See International Building Code Section 414.2.4 for additional requirements.

**5003.8.3 Control areas.** Control areas shall comply with Sections 5003.8.3.1 through 5003.8.3.5.

**Exception:** Higher education laboratories in accordance with Chapter 38 and Section 427 of the International Building Code.

**604.2.17 Laboratory suites.** Laboratory Suites shall be provided with emergency or standby power in accordance with Chapter 38.

Add new definition as follows:

**SECTION 202 DEFINITIONS**

**CHEMICAL FUME HOOD.** A ventilated enclosure designed to contain and exhaust fumes, gases, vapors, mists and
particulate matter generated within the hood.

SECTION 202 DEFINITIONS

GLOVE BOX. A sealed enclosure in which items inside the box are handled exclusively using long gloves sealed to ports in the enclosure.

SECTION 202 DEFINITIONS

LABORATORY SUITE, A fire-rated enclosed laboratory area that will provide one or more laboratory spaces, within a Group B educational occupancy, that are permitted to include ancillary uses such as offices, bathrooms, and corridors that are contiguous with the laboratory area, and are constructed in accordance with section 3804.

SECTION 202 DEFINITIONS

SPECIAL EXPERT. An individual who has demonstrated qualifications in a specific area, outside the practice of architecture or engineering, through education, training and experience.

2015 International Building Code

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles hazardous materials as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the International Fire Code.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the International Fire Code.
3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour fire barriers constructed in accordance with Section 707 or 1-hour horizontal assemblies constructed in accordance with Section 711, or both.
5. Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary batteries utilized for facility emergency power, uninterruptable power supply or telecommunication facilities, provided that the batteries are provided with safety venting caps and ventilation is provided in accordance with the International Mechanical Code.
10. Corrosive personal or household products in their original packaging used in retail display.
11. Commonly used corrosive building materials.
12. Buildings and structures occupied for aerosol storage shall be classified as Group S-1, provided that such buildings conform to the requirements of the International Fire Code.
13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per control area in Group M or S occupancies complying with Section 414.2.5.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the International Fire Code.
15. Group B Higher Education Laboratory occupancies complying with Section 427 and Chapter 38 of the IFC.

[F] 414.2 Control areas. Control areas shall comply with Sections 414.2.1 through 414.2.5 and the International Fire Code.

Exception: Higher education laboratories in accordance with Section 427 and Chapter 38 of the International Fire Code.

SECTION 427 HIGHER EDUCATION LABORATORIES

[F] 427.1 Scope. Laboratories in Group B occupancies used for educational purposes above the 12th grade complying with the requirements of this chapter shall be permitted to exceed the maximum allowable quantities of hazardous materials in control areas set forth in Chapter 50 without requiring classification as a Group H occupancy. Except as specified in this chapter, such laboratories shall comply with all applicable provisions of this code and the International Fire Code. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research

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or developmental activities on a nonproduction basis.

[F]427.2 Application. The provisions of this chapter shall be applied as exceptions or additions to applicable requirements of this code. Unless specifically modified by this chapter, the storage, use and handling of hazardous materials shall comply with all other provisions in Chapters 50 through 67 of the International Fire Code and this code for quantities not exceeding the maximum allowable quantity.

[F]427.3 Laboratory suite construction. Where laboratory suites are provided, they shall be constructed in accordance with this Section and Chapter 38 of the International Fire Code. The number of control areas and percentage of maximum allowable quantities of hazardous materials in laboratory suites shall be in accordance with Table 427.3.

[F]427.3.1 Separation from other non-laboratory areas. Laboratory suites shall be separated from other portions of the building in accordance with the most restrictive of the following:

1. Table 427.3 with fire barriers constructed in accordance with Section 707 and horizontal assemblies constructed in accordance with Section 711.

   Exception: Where an individual laboratory suite occupies more than one story, the fire resistance rating of intermediate floors contained within the laboratory suite shall comply with the requirements of this code.


[F]427.3.2 Separation from other Laboratory Suites. Laboratory suites shall be separated from other laboratory suites in accordance with Table 427.3.

[F]427.3.3 Floor Assembly Fire Resistance. The floor assembly supporting the laboratory suite and the construction supporting the floor of the laboratory suite shall have a fire resistance rating of not less than 2 hours.

   Exception: The floor assembly of the laboratory suite and the construction supporting the floor of the laboratory suite are allowed to be 1-hour fire resistance rated in buildings of Types IIA, IIB and VA construction, provided that the building is 3 or fewer stories.

[F]427.3.4 Maximum number. The maximum number of laboratory suites shall be in accordance with Table 427.3. Where a building contains both laboratory suites and control areas the total number of laboratory suites and control areas within a building shall not exceed the maximum number of laboratory suites in accordance with Table 427.3.

[F]427.3.5 Means of egress. Means of egress shall be in accordance with Chapter 10.

[F]427.3.6 Standby or emergency power. Standby or emergency power shall be provided in accordance with Section 5004.7 where laboratory suites are located above the sixth story above grade plane or located in a story below grade plane.

[F]427.3.7 Ventilation. Ventilation shall be in accordance with Chapter 7 of NFPA 45, and the International Mechanical Code.

[F]427.3.8 Liquid tight floor. Portions of the laboratory suite where hazardous materials are present shall be provided with a liquid tight floor.

[F]427.3.9 Automatic fire extinguishing systems. Buildings shall be equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

[F]427.4 Percentage of maximum allowable quantity in each laboratory suite. The percentage of maximum allowable quantities in each laboratory suite shall be in accordance with Table 427.3

### TABLE [F] 903.2.11.6

**ADDITIONAL REQUIRED SUPPRESSION SYSTEMS**

<table>
<thead>
<tr>
<th>SECTION</th>
<th>SUBJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>402.5, 402.6.2</td>
<td>Covered and open mall buildings</td>
</tr>
<tr>
<td>403.3</td>
<td>High-rise buildings</td>
</tr>
<tr>
<td>404.3</td>
<td>Atriums</td>
</tr>
<tr>
<td>405.3</td>
<td>Underground structures</td>
</tr>
<tr>
<td>407.6</td>
<td>Group I-2</td>
</tr>
<tr>
<td>410.7</td>
<td>Stages</td>
</tr>
<tr>
<td>411.4</td>
<td>Special amusement buildings</td>
</tr>
<tr>
<td>412.3.6</td>
<td>Airport traffic control towers</td>
</tr>
<tr>
<td>412.4.6, 412.4.6.1, 412.6.5</td>
<td>Aircraft hangars</td>
</tr>
<tr>
<td>415.11.11</td>
<td>Group H-5 HPM exhaust ducts</td>
</tr>
</tbody>
</table>
Reason: There is quite possibly no industry more important to lives across the world than higher education academic institutions. The advance of technologies, science, medicine and our knowledge of the world often relies on having vibrant and successful academic institutions.

These academic institutions often have chemistry, biology, medical, engineering and other laboratories where hazardous materials are used. The IFC does not specifically address teaching and research laboratories, so users must try to apply general hazardous materials provisions, which oftentimes are not appropriate for specialized academic laboratory settings.

The following is a list of several conditions typically present in academic laboratories that make them unique:

1. Lower chemical density in individual research laboratories. In a teaching and research environment, there are often many small laboratories within a building that are using small quantities of hazardous materials in each location. Individually, they do not store or use a large quantity of hazardous materials, but together, they may often exceed the maximum allowable quantities for the control area. This lower chemical density often mitigates the overall risk, but the IFC currently has no provisions to recognize this condition.

2. Ongoing staff oversight from “Special Experts” in laboratory safety. Many higher education institutions have a full cadre of faculty and staff with chemical expertise. These “Special Experts” often include, but are not limited to: Fire Marshals, Industrial Hygienists, Radiation Safety Officers, Biological Safety Officers, Chemical Hygiene Officers and Environmental Health and Safety Officers. These individuals are an integral part of the preparation/review of laboratory safety documentations, as well as regularly scheduled safety audits. Fire and life safety expertise and oversight on our campuses is continually increasing with the addition of these highly capable professionals.

3. Limited, or “directed”, funding streams. Also unique to academic institutions are the funding sources for research. In a “non-profit” teaching and research environment, the majority of research is funded through grants and endowments. Unfortunately, many grants only support the costs of research personnel and equipment, not structural upgrades to accommodate newer research processes.

4. Mixed-use occupancies. A typical university science building will house laboratories, office space, storerooms, classrooms and lecture halls. The current limits on hazardous materials are so restrictive on upper floors that many universities are forced to locate classrooms and lecture halls on the upper floors so that they can take full advantage of the hazardous materials quantities allowed on the lower floors. This results in moving large numbers of students through hallways, past laboratories to get to the upper floors. They will also have to exit back down the same routes in the event of an emergency.

This proposal introduces a post-secondary academic laboratory chapter to address these unique circumstances. University fire and life safety professionals from across the United States have collaborated on writing this chapter. Conscientious effort has been made to balance the proposed IFC modifications with enhanced administrative, emergency planning and structural provisions.

This chapter also introduces some important provisions from NFPA 45, Fire Protection for Laboratories. Although the IFC references many national standards on specific topics, there are no such references currently for laboratories. This standard contains many laboratory specific requirements and design professionals rely heavily upon this national standard for current laboratory designs.

Specifically, the chapter addresses three primary needs: 1) increasing general laboratory safety requirements, 2) increasing MAQ’s in large or multi-story laboratories, or laboratories located in multi-story buildings and, 3) allowing very small quantities of currently prohibited hazardous materials in non-sprinklered laboratory buildings. A brief description of each is as follows:
1. Increased general laboratory safety requirements: This proposal introduces a post-secondary academic laboratory chapter in to the IFC. Currently, there is no teaching/research laboratory specific chapter in the IFC, and there are no references to NFPA 45 (Fire Protection for Laboratories). This new chapter fills a much needed gap in the IFC, and provides for enhanced safety requirements in these academic laboratories.

2. Control Area Limitations: As post-secondary campuses across the world grow to meet increasing populations, they often are landlocked, and require that new buildings are built taller and/or larger. This is particularly true in large metropolitan areas. The current “Control Area” restrictions in the ICC codes severely restrict functioning laboratories on upper floor levels or in larger buildings.

   In response to this critical issue, numerous jurisdictions have adopted state or local amendments to allow for greater numbers of control areas and larger percentages of MAQs in academic and/or non-production laboratories. Such jurisdictions include California, Arizona, Minnesota, Seattle and New York City. One of the primary purposes of this proposal is to provide standardized model code language to address this topic.

   This chapter provides an alternate design approach for such scenarios where traditional control area limitations are not feasible, and where building Group H-Occupancies is not possible. The “Laboratory Suite” concept gives users an option to allow more flexibility in hazardous materials use, in exchange for additional administrative and structural safeguards, while still remaining a “B” occupancy.

3. Non-Sprinklered Limitations: There are thousands of existing post-secondary academic institutions, with some dating back to 1800’s, where retrofitting automatic sprinklers is not practical. This proposal addresses a critically important issue to selected laboratories in existing, non-sprinklered buildings, who need very small quantities of materials that have blanket restrictions in non-sprinklered buildings. This proposal provides a limited exception to allow very small quantities of such materials when specific mitigation controls are provided.

PART 1 REASON:

Section 3801. Provides general scoping information. It clarifies that the chapter applies to both existing laboratories in existing buildings and new laboratories as referenced in the sections.

   The definition used for laboratories mirrors the definition found in the International Mechanical Code, with the addition of language to clarify that the chapter is limited to “Laboratories in higher education institutions beyond the 12th grade”.

Section 3802. Provides definitions for new terms introduced in this chapter. The term “Special Expert” is in the International Performance Code in the appendix. It was utilized in this chapter to reflect the high level of faculty and staff safety professionals available at many academic institutions.

Section 3803. Requires additional safety pre-planning for all laboratories or laboratory suites utilizing this chapter, also consistent with laboratory safeguards found in NFPA 45. Enhanced safety requirements found in this section include:

   1. New hazard analysis documentation shall include: Process Hazard Analysis, Pre-startup Safety Review, Operating and Emergency Procedures, Management of Change, Accident Procedures, Consequence Analysis and Safety Audits. Requires that such documentation shall be submitted to the fire code official. (IFC Section 5001)
   2. Time-sensitive materials shall be dated and pro-actively managed. (NFPA 45)
   3. Maximum container size of Class I flammable liquids is 5.3 gallons. (NFPA 45)
   4. Density of Class I flammable liquids in storage and use shall be no greater than 8 gallons per 100 square feet of floor area. (NFPA45)

Section 3804. Provides the “Laboratory Suite” design option in addition to traditional control area options. Enhanced safety requirements in this section include:

   1. All of those listed above in in section 3803
   2. Rated fire barriers for compartmentation of laboratory suites within buildings.
   3. In laboratories above the 6th story, or in a story below grade plane, requirements for standby or emergency power for safety-related equipment and enhanced automatic sprinkler protection.
   4. Automatic sprinkler design and density exceeding that which would be required by NFPA 45.

   If the vertical fire barrier between lab suites is required to be two-hour rated, a fire rated duct enclosure, UL listed duct wrap, or multiple building shafts is required. Footnote c in the table allows the vertical fire barriers between laboratory suites on a floor to be one-hour rated because of the reduced quantities of hazardous materials in each laboratory suite on the floors above the 6th story, and additional safety provisions in Chapter 38 which apply to all laboratories utilizing this chapter. In addition, chemical exhaust ducts routed through the one-hour rated barriers would be permitted to be installed without fire dampers, where the duct needs to be routed to the nearest chemical exhaust shaft. Fire dampers are not installed in laboratory exhaust ducts to maintain exhaust ventilation in laboratories in the event of a fire. In the IBC, section 714.1.1 and section 717.5.2, exception 3; and IMC 607.5.5 allow exhaust system ducts to penetrate fire rated barriers and fire rated shafts without a fire damper. These provisions carry significant importance and allow multiple laboratory suites per floor of a building. The footnote has no effect on other provisions of the code and does not change the structural fire resistance requirements of IBC Chapter 6, or the continuity requirements of IBC Chapter 7.
Historical fire data over the last 25 years has shown that the vast majority of laboratory fires do not typically extend beyond the area, or even the room of origin. This is primarily due to the limited quantities of hazardous materials in use, and the following safety features that are incorporated into laboratory designs:

1. Ventilation systems provide large volumes of airflow through laboratories to continuously remove hazardous vapors, fumes and gases.
2. Fume hoods provide local ventilation control for containment and removal of hazardous vapors, fumes and gases during the use of hazardous materials.
3. Automatic fire sprinkler systems can confine the fires to the room of origin
4. Fire alarm systems provide prompt notification to building occupants and/or emergency responders.

All of these structural safety features are required in some combination in laboratories utilizing this chapter, as well as the additional NFPA 45 requirements for monitoring of time-sensitive materials, limitations on container sizes and limiting the density of flammable liquids over the floor area of laboratory space.

Section 3805. Provides and clarifies general hazardous materials requirements for non-sprinklered laboratories. Provides an option to allow for very small quantities of prohibited materials in non-sprinklered laboratories. Enhanced safety requirements in this section include:

1. All of those listed above in section 3803
2. Enhanced storage requirements in accordance with NFPA 45
4. Use of hazardous materials use must be in a chemical fume hood, glove box or other approved laboratory equipment designed for the specific hazard.
5. The work area must be free of all unnecessary combustible materials
6. There must be an appropriate extinguishing media located within 20 feet.

Section 3806. Provides requirements for existing laboratories in existing sprinklered buildings. Enhanced safety requirements in this section include all of those in section 3803, including complete hazard analysis and safety audits, and limits on container sizes for all hazardous materials and density limits on flammable liquids.

PART 2 REASON:
Modifies IBC 414.2 to identify that "Laboratory Suites" are an exception to traditional control area provisions.

PART 3 REASON:
Modifies IFC 604.2 to identify that "Laboratory Suites" require emergency or standby power.

PART 4 REASON:
Adds NFPA 45 as recognized standard.

This chapter was written and reviewed by a national taskforce made up of fire and life safety professionals from colleges, universities, municipal fire organizations and private industry across the United States. Taskforce members are individuals representing their own institutions, as well as members who were assigned participants by national college and university safety associations.

National endorsements:
Campus Safety, Health, and Environmental Management Association (CSHEMA)
Center for Campus Fire Safety (CCFS)

Chapter 38 Taskforce

Taskforce Chairperson – Morgana Yahnke, University of California, Davis

University Representatives:
Zachary Adams, Virginia Polytechnic Institute and State University and designated representative for Campus Safety, Health, and Environmental Management Association (CSHEMA)
Dwain Archer, University of Louisville
Jason Ellis, University of Kentucky, Principal Voting Member – NFPA 45
Todd Griffin, University of South Carolina
William Guffey, University of Maryland and designated representative for the Center for Campus Fire Safety (CCFS)
Megan Hall, University of California, Berkeley
Scott Jackson, University of California, Irvine
Joseph Klancher, University of Minnesota
Ken Kretchman, North Carolina State University
Paige McKibbin, University of California, Davis
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

### Table: Comparison of the storage MAQ allowances and number of control areas for Class 1B Flammable Liquids

<table>
<thead>
<tr>
<th>Floor Level</th>
<th>2015 International Fire Code B Occupancy</th>
<th>Chapter 38: MAQ in Existing Non-Sprinklered Labs B Occupancy</th>
<th>Chapter 38: MAQ in Existing Sprinklered Labs B Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of MAQ times # of Control area = total volume per floor</td>
<td>% of MAQ times # of Labs = total volume per floor</td>
<td>% of MAQ times # of Control area = total volume per floor</td>
</tr>
<tr>
<td>21+</td>
<td>5 % x 1 = 6 gal</td>
<td>5 % x 1 = 6 gal</td>
<td>5 % x 1 = 6 gal</td>
</tr>
<tr>
<td>16-20</td>
<td>5 % x 1 = 6 gal</td>
<td>5 % x 1 = 6 gal</td>
<td>10 % x 1 = 12 gal</td>
</tr>
<tr>
<td>15</td>
<td>5 % x 1 = 6 gal</td>
<td>5 % x 1 = 6 gal</td>
<td>10 % x 1 = 12 gal</td>
</tr>
<tr>
<td>11-14</td>
<td>5 % x 1 = 6 gal</td>
<td>5 % x 1 = 6 gal</td>
<td>10 % x 1 = 12 gal</td>
</tr>
<tr>
<td>10</td>
<td>5 % x 1 = 6 gal</td>
<td>5 % x 1 = 6 gal</td>
<td>25 % x 2 = 60 gal</td>
</tr>
<tr>
<td>9</td>
<td>5 % x 2 = 12 gal</td>
<td>10 % x 2 = 24 gal</td>
<td>25 % x 2 = 60 gal</td>
</tr>
<tr>
<td>8</td>
<td>5 % x 2 = 12 gal</td>
<td>10 % x 2 = 24 gal</td>
<td>25 % x 2 = 60 gal</td>
</tr>
<tr>
<td>7</td>
<td>5 % x 2 = 12 gal</td>
<td>10 % x 2 = 24 gal</td>
<td>25 % x 2 = 60 gal</td>
</tr>
<tr>
<td>6</td>
<td>12.5 % x 2 = 30 gal</td>
<td>25 % x 2 = 60 gal</td>
<td>50 % x 2 = 120 gal</td>
</tr>
<tr>
<td>5</td>
<td>12.5 % x 2 = 30 gal</td>
<td>25 % x 2 = 60 gal</td>
<td>50 % x 2 = 120 gal</td>
</tr>
<tr>
<td>4</td>
<td>12.5 % x 2 = 30 gal</td>
<td>25 % x 2 = 60 gal</td>
<td>50 % x 2 = 120 gal</td>
</tr>
<tr>
<td>3</td>
<td>50 % x 2 = 120 gal</td>
<td>75 % x 2 = 180 gal</td>
<td>75% x 3 = 270 gal</td>
</tr>
<tr>
<td>2</td>
<td>75 % x 3 = 270 gal</td>
<td>100 % x 4 = 480 gal</td>
<td>100% x 4 = 480 gal</td>
</tr>
<tr>
<td>1</td>
<td>100 % x 4 = 480 gal</td>
<td>100% x 4 = 480 gal</td>
<td>100% x 4 = 480 gal</td>
</tr>
<tr>
<td>Below Grade 1</td>
<td>75 % x 3 = 67.5 gal</td>
<td>100 % x 3 = 90 gal</td>
<td>100% x 3 = 90 gal</td>
</tr>
<tr>
<td>Below Grade 2</td>
<td>50 % x 2 = 30 gal</td>
<td>75 % x 2 = 0 gal</td>
<td>75% x 2 = 45 gal</td>
</tr>
<tr>
<td>Lower than 2</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
</tr>
</tbody>
</table>

1 Listed volumes do not include increases allowed for sprinklers or reflect increases for storage within a flammable cabinet
2 Class 1 liquids shall be allowed to be stored in basements in amounts not exceeding the MAQ for use-open systems from Table 5003.1.10.1 provided that automatic fire suppression and other fire protection features are in accordance with Chapter 9
Committee Action: Approved as Submitted

Assembly Action: None

Cost Impact: Will increase the cost of construction
The code change proposal will increase the cost of construction for those entities choosing to voluntarily comply with the requirements of this chapter.

Analysis: This code change proposal was initially placed on the ballot for an assembly motion. Upon further review, it was discovered that the motion did not receive a second. Therefore the proposal was removed from the ballot.
Public Comment 1:

Proponent: Michael O'Brien representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

604.2.17 (IBC [F] 2702.2.17) Laboratory suites. Laboratory suites shall be provided with emergency or standby power in accordance with Chapter 38 Section 3804.11.6.

Commenter's Reason: This public comment references the exact section for emergency or standby power requirements, rather than the broader Chapter 38 reference. This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Analysis: Note that this section will be renumbered within Section 604.2 of the IFC and Section 2702.2 of the IBC to be within alphabetical order to be consistent with the current content of those sections.

Public Comment 2:

Proponent: Michael O'Brien representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

SECTION 202 DEFINITIONS

GENERAL DEFINITIONS HIGHER EDUCATION LABORATORY. Laboratories in Group B occupancies used for educational purposes above the 12th grade. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.

3801.1 Scope. Laboratories in Group B occupancies used for educational purposes above the 12th grade Higher education laboratories complying with the requirements of this chapter shall be permitted to exceed the maximum allowable quantities of hazardous materials in control areas set forth in Chapter 50 without requiring classification as a Group H occupancy. Except as specified in this chapter, such laboratories shall comply with all applicable provisions of this code and the Building Code. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.

3802.1 Definitions. The following terms are defined in Chapter 2:

CHEMICAL FUME HOOD
GLOVE BOX
HIGHER EDUCATION LABORATORY
LABORATORY SUITE
SPECIAL EXPERT

2015 International Building Code

SECTION 202 DEFINITIONS

DEFINITIONS

HIGHER EDUCATION LABORATORY. Laboratories in Group B occupancies used for educational purposes above the 12th
grade. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.

[F]427.1 Scope. Laboratories in Group B occupancies used for educational purposes above the 12th grade
Higher education laboratories complying with the requirements of this chapter shall be permitted to exceed the maximum allowable quantities of hazardous materials in control areas set forth in Chapter 50 without requiring classification as a Group H occupancy. Except as specified in this chapter, such laboratories shall comply with all applicable provisions of this code and the International Fire Code. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.

Commenter's Reason: "Higher Education Laboratory" is a specific use, not an occupancy type, and a definition was needed to clarify the intended application of the provisions in Chapter 38.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Public Comment 3:

Proponent: Michael O'Brian representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code
3803.1.7 Ventilation. Ventilation for laboratories and laboratory equipment shall be designed and installed in accordance with the requirements in the International Mechanical Code and Chapter 7, NFPA 45.

Commenter's Reason: These ventilation requirements were incorrectly included in this "General" section, although they are only intended to apply to new laboratories, not both new and existing laboratories. The requirements are also correctly included in the Laboratory Suite section 3804.1.1.7.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Public Comment 4:

Proponent: Michael O'Brian (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code
3805.2.1 Restricted Materials Storage. Storage Where approved by the fire code official, storage of the following hazardous materials prohibited by Table 5003.1.1 5003.1.1(1) in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, shall be allowed within a laboratory control area at 25% of Table 5003.1.1 5003.1.1(1) limits for a building equipped throughout with an automatic sprinkler system, with no additional:

1. Pyrophorics
2. Class 4 Oxidizers

Additional quantity increases allowed shall be prohibited, provided that and all such materials are stored in accordance with all of the following:

1. Containers shall be completely sealed and stored according to the manufacturer's recommendations.
2. Storage shall be within approved hazardous materials storage cabinets in accordance with Section 5003.8.7, or shall be located in an inert atmosphere glove box in accordance with NFPA 45 Section 7.11.
3. The storage cabinet or glove box shall not contain any storage of incompatible materials.

3805.2.2 Restricted materials use. Use Where approved by the fire code official, use of the following hazardous materials prohibited by Table 5003.1.1(1) in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, shall be allowed within a laboratory control area at 25% of Table 5003.1.1(1) limits for buildings equipped throughout with an automatic sprinkler system, with no additional:

1. Pyrophorics
2. Class 4 Oxidizers

Additional quantity increases allowed shall be prohibited, provided that all such materials are used in accordance with all of the following:

1. Use shall be within an approved chemical fume hood listed in accordance with UL 1805, or in an inert atmosphere glove box in accordance with NFPA 45 Section 7.11, or other approved equipment designed for the specific hazard of the material.
2. Combustible materials shall be kept at least 0.610 m (2 ft.) away from the work area, except for those items directly related to the research.
3. A portable fire extinguisher appropriate for the specific material shall be provided within 20 feet of the use in accordance with Section 906.

Commenter's Reason: As written, this section allowed all five classes of hazardous materials that are currently restricted from use/storage in a non-sprinkled building. Based upon feedback from fire service professionals, this section is being made more restrictive in two ways:

1. The phrase, "When approved by the fire code official," has been added to the section to emphasize that these materials are only allowed in these laboratories when specifically approved by the fire code official and,
2. The materials allowed are limited to exclusively Pyrophorics and Class 4 Oxidizers. These are the most commonly needed material classifications that can be used safely within the parameters of this chapter.

There was also a minor editorial correction to reflect the correct table number referenced in Chapter 50.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Public Comment 5:

Proponent: Michael O'Brian (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

TABLE 3805.4
DESIGN AND NUMBER OF CONTROL AREAS IN EXISTING NON-SPRINKLERED LABORATORIES

<table>
<thead>
<tr>
<th>FLOOR LEVEL</th>
<th>PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA</th>
<th>NUMBER OF CONTROL AREAS PER FLOOR</th>
<th>FIRE RESISTANCE RATING FOR FIRE BARRIERS IN HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above grade plane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher than 9</td>
<td>54%</td>
<td>1</td>
<td>2hr</td>
</tr>
<tr>
<td>7-9</td>
<td>10%</td>
<td>2</td>
<td>2hr</td>
</tr>
<tr>
<td>4-6</td>
<td>25%</td>
<td>2</td>
<td>2hr</td>
</tr>
<tr>
<td>3</td>
<td>75%</td>
<td>2</td>
<td>2hr</td>
</tr>
<tr>
<td>1-2</td>
<td>100%</td>
<td>4</td>
<td>2hr</td>
</tr>
<tr>
<td>Below grade plane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>100%-75</td>
<td>3</td>
<td>1 hr</td>
</tr>
<tr>
<td>2</td>
<td>75%-50</td>
<td>2</td>
<td>1 hr</td>
</tr>
<tr>
<td>Lower than 2</td>
<td>Not allowed</td>
<td>Not Allowed</td>
<td>Not allowed</td>
</tr>
</tbody>
</table>

a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 5003.1.1(1) and 5003.1.1(2), excluding all increases allowed in the footnotes to those tables.
b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.
c. Vertical fire barriers separating control areas from other spaces on the same floor shall be permitted to be one hour rated.
d. See *International Building Code* Section 414.2.4 for additional requirements.

**Commenter's Reason:** This public comment corrects three data-entry errors on this table:
1. It adds footnotes a and b to the correct column headings,
2. It removes the footnote c from applying more generally as the reduction to 1 hour would only be applicable to the 2 hour fire resistance rating for fire barriers.
3. It removes the percentage symbols from the values within columns.

It also reduces the proposed below grade MAQ percentages and allows the increases for approved storage cabinets and automatic sprinklersystems in order to remain consistent with current IFC requirements.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

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**Public Comment 6:**

**Proponent:** Michael O'Brien representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

**Modify as Follows:**

2015 International Fire Code

**3806.1 Scope.** Storage and use of hazardous materials in new and existing laboratories in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, shall be in accordance with Section 3803, and with Chapters 50-67 as applicable, except as modified by this section.

**Commenter's Reason:** By striking the word “new”, this public comment is intended to clarify that this section applies only to existing laboratories.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

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**Public Comment 7:**

**Proponent:** Michael O'Brien representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

**Modify as Follows:**

2015 International Fire Code

**TABLE 3806.2.1**

<table>
<thead>
<tr>
<th>FLOOR LEVEL</th>
<th>PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA&lt;sup&gt;a&lt;/sup&gt;</th>
<th>NUMBER OF CONTROL AREAS PER FLOOR</th>
<th>FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS&lt;sup&gt;b,d&lt;/sup&gt;</th>
</tr>
</thead>
</table>

---
a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 5003.1.1(1) and 5003.1.1(2), with all increases allowed in the footnotes to those tables.

b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.

c. Vertical fire barriers separating control areas from other spaces on the same floor shall be permitted to be one-hour rated.

d. See International Building Code, International Building Code Section 414.2.4 for additional requirements.

Commenter's Reason: This public comment corrects four data-entry errors on this table:
1. It adds footnotes c which was inadvertently omitted.
2. It removes footnote d (formally c) from the last sentence of footnote b and places it correctly as footnote d.
3. It removes the footnote c from applying more generally as the reduction to 1 hour would only be applicable to the 2 hour fire resistance rating for fire barriers.
4. It removes the percentage symbols from the values within columns.

It also reduces the proposed below grade MAQ percentages to remain consistent with current IFC MAQ’s per control area.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Public Comment 8:

Proponent : Michael O’Brien (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Building Code

[F]427.1 Scope. Laboratories in Group B occupancies used for educational purposes above the 12th grade complying with the requirements of this chapter Sections 427.1 through 427.4 shall be permitted to exceed the maximum allowable quantities of hazardous materials in control areas set forth in Chapter 50 Tables 307.1(1) and 307.1(2) without requiring classification as a Group H occupancy. Except as specified in this chapter Sections 427.1 through 427.4, such laboratories shall comply with all applicable provisions of this code and the International Fire Code. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.

[F]427.2 Application. The provisions of this chapter Sections 427.1 through 427.4 shall be applied as exceptions or additions to applicable requirements of this code. Unless specifically modified by this chapter Sections 427.1 through 427.4, the storage, use and handling of hazardous materials shall comply with all other provisions in Chapters 38 and 50 through 67 of the International Fire Code and this code for quantities not exceeding the maximum allowable quantity.

Commenter's Reason: The original scope and application language was copied from Chapter 38 in the IFC, but was not adjusted to reflect that it was residing in the International Building Code. These revisions correct the code reference errors in the language to reflect appropriate IFC and IBC references.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban
interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Public Comment 9:

Proponent : Michael O’Brien representing Fire Code Action Committee (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Building Code

<table>
<thead>
<tr>
<th>FLOOR LEVEL</th>
<th>PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER LAB SUITE</th>
<th>NUMBER OF LAB SUITES PER FLOOR</th>
<th>FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above Grade Plane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21+</td>
<td>Not allowed</td>
<td>Not Permitted</td>
<td>Not Permitted</td>
</tr>
<tr>
<td>16-20</td>
<td>25</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>11-15</td>
<td>50</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7-10</td>
<td>50</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>4-6</td>
<td>75</td>
<td>4</td>
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</tr>
<tr>
<td>3</td>
<td>100</td>
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<td>1</td>
</tr>
<tr>
<td>1-2</td>
<td>100</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Below Grade Plane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>75</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>50</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Lower than 2</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
</tr>
</tbody>
</table>

a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 5003.1.1(1) and 5003.1.1(2), with all increases allowed in the footnotes to those tables.
b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.
c. Vertical fire barriers separating laboratory suites from other spaces on the same floor shall be permitted to be one hour rated.

Commenter’s Reason: Table 3804.1.1, Design and Number of Laboratory Suites per Floor was referenced in the original proposal and intended to be reproduced in the International Building Code in section 427.3. It was inadvertently omitted from the original proposal and is included here as the appropriate reference table numbered 427.3.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)
**Table 5003.1.1; IBC [F] Table 307.1(1)**

**Proposed Change as Submitted**

**Proponent**: Ellie Klausbruckner, representing Klausbruckner & Associates (ek@klausbruckner.com)

2015 International Fire Code

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>CLASS</th>
<th>GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED</th>
<th>STORAGE&lt;sup&gt;b&lt;/sup&gt;</th>
<th>USE-CLOSED SYSTEMS&lt;sup&gt;b&lt;/sup&gt;</th>
<th>USE-OPEN SYSTEMS&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Solid pounds (cubic feet)</td>
<td>Liquid gallons (pounds)</td>
<td>Gas (cubic feet at NTP)</td>
</tr>
<tr>
<td>Combustible dust</td>
<td>NA</td>
<td>H-2</td>
<td>Not Limited</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Combustible fibers&lt;sup&gt;c, i&lt;/sup&gt;</td>
<td>Loose Baled&lt;sup&gt;d&lt;/sup&gt;</td>
<td>H-3 (100) (1,000)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Combustible liquid&lt;sup&gt;c, i&lt;/sup&gt;</td>
<td>II</td>
<td>H-2 or H-3</td>
<td>120&lt;sup&gt;e&lt;/sup&gt;</td>
<td>330&lt;sup&gt;d&lt;/sup&gt; (e) (f)</td>
<td>13,200&lt;sup&gt;e&lt;/sup&gt; (f)</td>
</tr>
<tr>
<td></td>
<td>IIIA</td>
<td>H-2 or H-3</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>IIIB</td>
<td>NA</td>
<td>125&lt;sup&gt;e, l&lt;/sup&gt;</td>
<td>45&lt;sup&gt;d&lt;/sup&gt;</td>
<td>NA</td>
</tr>
<tr>
<td>Consumer fireworks</td>
<td>1.4G</td>
<td>H-3</td>
<td>125&lt;sup&gt;e, l&lt;/sup&gt;</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Cryogenic Flammable</td>
<td>NA</td>
<td>H-2</td>
<td>45&lt;sup&gt;d&lt;/sup&gt;</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Cryogenic Inert</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>Cryogenic Oxidizing</td>
<td>NA</td>
<td>H-3</td>
<td>45&lt;sup&gt;d&lt;/sup&gt;</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>Explosives</td>
<td>Division 1.1</td>
<td>H-1</td>
<td>1&lt;sup&gt;e, j&lt;/sup&gt;</td>
<td>(1)&lt;sup&gt;e, j&lt;/sup&gt;</td>
<td>NA</td>
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<tr>
<td></td>
<td>Division 1.2</td>
<td>H-1</td>
<td>1&lt;sup&gt;e, g&lt;/sup&gt;</td>
<td>(1)&lt;sup&gt;e, g&lt;/sup&gt;</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Division 1.3</td>
<td>H-1 or H-2</td>
<td>5&lt;sup&gt;e, g&lt;/sup&gt;</td>
<td>(5)&lt;sup&gt;e, g&lt;/sup&gt;</td>
<td>NA</td>
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<tr>
<td></td>
<td>Division 1.4</td>
<td>H-3</td>
<td>50&lt;sup&gt;e, g&lt;/sup&gt;</td>
<td>(50)&lt;sup&gt;e, g&lt;/sup&gt;</td>
<td>0.25&lt;sup&gt;g&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Division 1.4G</td>
<td>H-3</td>
<td>125&lt;sup&gt;d, e, f&lt;/sup&gt;</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Division 1.5</td>
<td>H-1</td>
<td>1&lt;sup&gt;e, g&lt;/sup&gt;</td>
<td>(1)&lt;sup&gt;e, g&lt;/sup&gt;</td>
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<td>1&lt;sup&gt;e, g&lt;/sup&gt;</td>
<td>(1)&lt;sup&gt;e, g&lt;/sup&gt;</td>
<td>NA</td>
</tr>
<tr>
<td>Flammable gas</td>
<td>Gaseous Liquefied</td>
<td>H-2</td>
<td>NA</td>
<td>NA</td>
<td>1,000&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Flammable liquid&lt;sup&gt;c, i&lt;/sup&gt;</td>
<td>IA</td>
<td>H-2 or H-3</td>
<td>30&lt;sup&gt;d, e, h&lt;/sup&gt;</td>
<td>120&lt;sup&gt;d, e, h&lt;/sup&gt;</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>IB and IC</td>
<td>H-2 or H-3</td>
<td>120&lt;sup&gt;d, e, h&lt;/sup&gt;</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>
| Flammable solid                 | NA    | H-3                                                    | 125<sup>d</sup> | NA | NA                           | 125<sup>d</sup> | NA | NA | 25<sup>d</sup> | NA | 2016 ICC PUBLIC COMMENT AGENDA | Page 1526
| Category          | Gaseous Liquefied | NA | NA | NA | NA | NL | NA | NA | NA | NA |
|-------------------|-------------------|----|----|----|----|----|----|----|----|----|----|
| **Inert Gas**     | UD                | H-1| 1<sup>e</sup>, y | (5)<sup>d</sup>, e | (1)<sup>e</sup>, y | 1<sup>d</sup> | (0.25)<sup>y</sup> | NA | (0.25)<sup>y</sup> | NA | 0.25<sup>y</sup> |
|                   | I                 | H-2| 50<sup>d</sup>, e | (50)<sup>d</sup>, e | 1<sup>d</sup> | (1)<sup>d</sup> | 25<sup>d</sup> | (10)<sup>d</sup> | 25<sup>d</sup> | (10)<sup>d</sup> |
|                   | II                | H-3| 125<sup>d</sup>, e | (125)<sup>d</sup>, e | 125<sup>d</sup> | (125)<sup>d</sup> | NL | NL | NL | NL |
|                   | III               | H-3| NL | NL | NL | NL | NL | NL | NL | NL |
|                   | IV                | NA | NL | NL | NL | NL | NL | NL | NL | NL |
|                   | V                 | NA | NL | NL | NL | NL | NL | NL | NL | NL |
| **Organic peroxide** | H-1 | 0.25<sup>y</sup> | 0.25<sup>y</sup> | NA | (0.25)<sup>y</sup> | NA | (0.25)<sup>y</sup> | NA | (0.25)<sup>y</sup> | NA | (0.25)<sup>y</sup> |
|                   | H-2 | 5 | (5) | 1 | (1) | 10<sup>d</sup> | (5)<sup>d</sup> | 25<sup>d</sup> | (10)<sup>d</sup> | 25<sup>d</sup> | (10)<sup>d</sup> |
|                   | H-3 | 125<sup>d</sup>, e | (125)<sup>d</sup>, e | 125<sup>d</sup> | (125)<sup>d</sup> | NL | NL | NL | NL | NL |
|                   | H-3 | 10<sup>d</sup> | (10)<sup>d</sup> | 10<sup>d</sup> | (10)<sup>d</sup> | NL | NL | NL | NL | NL |
| **Oxidizer**      | H-1 | 1<sup>y</sup> | (2)<sup>d</sup> | 2<sup>d</sup> | (2)<sup>d</sup> | 1<sup>y</sup> | (1)<sup>y</sup> | 1<sup>y</sup> | (1)<sup>y</sup> | 1<sup>y</sup> | (1)<sup>y</sup> |
|                   | H-2 or H-3 | 10<sup>d</sup> | (250)<sup>d</sup>, e | 250<sup>d</sup> | (250)<sup>d</sup> | 4,000<sup>e</sup>, f | (4,000)<sup>e</sup>, f | NA | (0.25)<sup>y</sup> | NA | (0.25)<sup>y</sup> |
|                   | H-3 | 250<sup>d</sup>, e | (250)<sup>d</sup>, e | 250<sup>d</sup> | (250)<sup>d</sup> | 4,000<sup>e</sup>, f | (4,000)<sup>e</sup>, f | NA | (0.25)<sup>y</sup> | NA | (0.25)<sup>y</sup> |
|                   | H-3 | 4,000<sup>e</sup>, f | (4,000)<sup>e</sup>, f | 4,000<sup>e</sup>, f | (4,000)<sup>e</sup>, f | NA | (0.25)<sup>y</sup> | NA | (0.25)<sup>y</sup> | NA | (0.25)<sup>y</sup> |
| **Oxidizing gas** | H-3 | NA | (150)<sup>d</sup>, e | 1,500<sup>d</sup>, e | NA | (150)<sup>d</sup>, e | NA | (150)<sup>d</sup>, e | NA | (150)<sup>d</sup>, e | NA | (150)<sup>d</sup>, e |
| **Pyrophoric**    | H-2 | 4<sup>e</sup>, y | (4)<sup>e</sup>, y | 50<sup>h</sup>, y | 1<sup>y</sup> | (1)<sup>y</sup> | 1<sup>y</sup> | (1)<sup>y</sup> | 1<sup>y</sup> | (1)<sup>y</sup> | 1<sup>y</sup> | (1)<sup>y</sup> |
|                   | H-1 | 1<sup>e</sup>, y | (5)<sup>d</sup>, e | 10<sup>e</sup>, y | (50)<sup>d</sup>, e | 750<sup>d</sup>, e | 50<sup>d</sup>, e | 750<sup>d</sup>, e | 50<sup>d</sup>, e | 750<sup>d</sup>, e | 50<sup>d</sup>, e | 750<sup>d</sup>, e |
|                   | H-3 | 50<sup>d</sup>, e | (50)<sup>d</sup>, e | 50<sup>d</sup>, e | (50)<sup>d</sup>, e | 10<sup>d</sup>, e | (10)<sup>d</sup>, e | 10<sup>d</sup>, e | (10)<sup>d</sup>, e | 10<sup>d</sup>, e | (10)<sup>d</sup>, e | 10<sup>d</sup>, e |
| **Unstable (reactive)** | H-1 | 0.25<sup>y</sup> | 0.25<sup>y</sup> | 2<sup>e</sup>, y | (1)<sup>y</sup> | 1<sup>y</sup> | (1)<sup>y</sup> | 1<sup>y</sup> | (1)<sup>y</sup> | 1<sup>y</sup> | (1)<sup>y</sup> | 1<sup>y</sup> | (1)<sup>y</sup> |
|                   | H-2 | 10<sup>d</sup> | (50)<sup>d</sup>, e | 10<sup>d</sup> | (50)<sup>d</sup>, e | 10<sup>d</sup> | (50)<sup>d</sup>, e | 10<sup>d</sup> | (50)<sup>d</sup>, e | 10<sup>d</sup> | (50)<sup>d</sup>, e | 10<sup>d</sup> | (50)<sup>d</sup>, e |
|                   | H-3 | 50<sup>d</sup>, e | (50)<sup>d</sup>, e | 50<sup>d</sup>, e | (50)<sup>d</sup>, e | 50<sup>d</sup>, e | (50)<sup>d</sup>, e | 50<sup>d</sup>, e | (50)<sup>d</sup>, e | 50<sup>d</sup>, e | (50)<sup>d</sup>, e | 50<sup>d</sup>, e | (50)<sup>d</sup>, e |
| **Water reactive** | H-2 | NA | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL |
|                   | H-3 | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL |
|                   | H-1 | 5<sup>d</sup>, e | (50)<sup>d</sup>, e | 5<sup>d</sup>, e | (50)<sup>d</sup>, e | 1<sup>d</sup> | (1)<sup>d</sup> | 1<sup>d</sup> | (1)<sup>d</sup> | 1<sup>d</sup> | (1)<sup>d</sup> | 1<sup>d</sup> | (1)<sup>d</sup> |

For SI: 1 cubic foot = 0.02832 m<sup>3</sup>, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

NA = Not Applicable, NL = Not Limited, UD = Unclassified Detonable.

a. For use of control areas, see Section 5003.8.3.

b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.

c. The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, day boxes, gas cabinets, gas rooms, exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10. Where Note d also applies, the increase for both notes shall be applied accumulatively.

f. Quantities shall not be limited in a building equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

g. Allowed only in buildings equipped throughout with an approved automatic sprinkler system.

h. Containing not more than the maximum allowable quantity per control area of Class IA, Class IB or Class IC flammable liquids.

i. The maximum allowable quantity shall not apply to fuel oil storage complying with Section 603.3.2.

j. Quantities in parenthesis indicate quantity units in parenthesis at the head of each column.
k. A maximum quantity of 200 pounds of solid or 20 gallons of liquid Class 3 oxidizers is allowed where such materials are necessary for maintenance purposes, operation or sanitation of equipment where the storage containers and the manner of storage are approved.

l. Net weight of pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks including packaging shall be used.

m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

n. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 5003.11, see Table 5003.11.1.

o. Densely-packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.

p. The following shall not be included in determining the maximum allowable quantities:

1. Liquid or gaseous fuel in fuel tanks on vehicles.

2. Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with this code.


4. Liquid fuels in piping systems and fixed appliances, regulated by the International Mechanical Code.

5. Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents.

q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.7.2 and Chapter 22.

**Reason:** Footnote q is only in reference to use where a hazard condition exists as a result of use. Also a reference to Chapter 22 has been added sending users to this particular Chapter for guidance on the evaluation.

**Cost Impact:** Will not increase the cost of construction
The change to the table is only an editorial change and therefore does not impact the cost to construction. The change to Footnote q is only sending the user to the correct chapter. Chapter 22 is already existing and applicable. Therefore it does not impact the cost to construction.

Individual Consideration Agenda

**Proponent:** Robert Davidson, representing Self (rjd@davidsoncodeconcepts.com) requests Disapprove.

**Commenter's Reason:** This public comment requests disapproval. The initial proposal as submitted deletes an important footnote from the storage cell for dust hazards in the table based upon an incorrect assumption and adds language to Note q that serves no purpose and can cause confusion.
The reason statement provided states: "Footnote q is only in reference to use where a hazard condition exists as a result of use. Also a reference to Chapter 22 has been added sending users to this particular Chapter for guidance on the evaluation."

The submitter incorrectly indicates that dust explosion hazards only occur as a result of use, that there are no hazards associated with storage, therefor the note advising an assessment of the storage hazards can be deleted. How many storage silo explosions do we need to review going back through history to understand "storage" activities can also produce dust explosion hazards? There have been deaths and injuries due to the "storage" of combustible dusts including of firefighters.

http://www.cdc.gov/niosh/fire/reports/face201122.html

The various NFPA standards the IFC relies upon to address dust explosion hazards apply to the entire processes identified including storage. Some of the standards actually identify which specific storage activities they don't apply to based upon recognition that those types of storage do not present explosion hazards. This proposal simply tells the user to ignore any potential storage hazard.

**NFPA 652-2016 Edition**

*Standard on the Fundamentals of Combustible Dust*

Chapter 1 Administration

1.1 Scope. This standard shall provide the basic principles of and requirements for identifying and managing the fire and explosion hazards of combustible dusts and particulate solids.

1.3.2 This standard shall apply to all facilities and operations that manufacture, process, blend, convey, repackage, generate, or handle combustible dusts or combustible particulate solids.

1.3.3 This standard shall not apply to the following:

1. Storage or use of consumer quantities of such materials on the premises of residential or office occupancies
2. Storage or use of commercially packaged materials at retail facilities
3. Such materials displayed in original packaging in mercantile occupancies and intended for personal or household use or as building materials
4. Warehousing of sealed containers of such materials when not associated with an operation that handles or generates combustible dust
5. Such materials stored or used in farm buildings or similar occupancies for on-premises agricultural purposes

**NFPA 61-2017 Edition**

*Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities*

1.3 Application.

1.3.1* This standard shall apply to all of the following:

1. All facilities that receive, handle, process, dry, blend, use, mill, package, store, or ship dry agricultural bulk materials, their by-products, or dusts that include grains, oilseeds, agricultural seeds, legumes, sugar, flour, spices, feeds, dry dairy/food powders, and other related materials
2. All facilities designed for manufacturing and handling starch, including drying, grinding, conveying, processing, packaging, and storing dry or modified starch, and dry products and dusts generated from these processes
3. Those seed preparation and meal-handling systems of oilseed processing plants not covered by NFPA 36

**NFPA 650-1998 Edition**

*Pneumatic Conveying Systems for Handling Combustible Particulate Solids*

1-1 Scope.

1-1.1* This standard shall apply to all pneumatic conveying systems that transport combustible particulate solids, combustible dusts, or hybrid mixtures containing dusts, regardless of concentration or particle size, including systems that convey nuisance or fugitive combustible dusts.

**NFPA 651-1998 Edition**

*Machining and Finishing of Aluminum and the Production and Handling of Aluminum Powders*

Chapter 1 General

1-1 Scope.

1-1.1* This standard shall apply to manufacturing facilities that produce aluminum flake powder, aluminum paste, atomized aluminum powder or aluminum granules, or any aluminum alloy powder that is combustible or explosive in an ambient atmosphere.

1-1.2 This standard also shall apply to operations where aluminum or aluminum alloys are subjected to processing or finishing operations that produce fine metallic powder or dust. Such operations include, but are not limited to, machining, sawing, grinding, buffing, and polishing.
1.1.3 This standard also shall apply to the handling and storage of combustible aluminum dusts, aluminum powders, or aluminum pastes by users of such material.

**NFPA 654-2017 Edition**

*Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids*

Chapter 1 Administration

1.1* Scope.

1.1.1 This standard provides requirements for all phases of the manufacturing, processing, blending, conveying, repackaging, and handling of combustible particulate solids or hybrid mixtures, regardless of concentration or particle size, where the materials present a fire, a flash fire, or an explosion hazard.

1.4 Application.

1.4.1 This standard shall be used to supplement the requirements established by NFPA 652.

1.4.2 This standard shall not apply to the following:

1. Storage or use of consumer quantities of such materials on the premises of residential or office occupancies
2. Storage or use of commercially packaged materials at retail facilities
3. Such materials displayed in original packaging in mercantile occupancies and intended for personal or household use or as building materials
4. Warehousing of sealed containers of such materials when not associated with an operation that handles or generates combustible dust
5. Such materials stored or used in farm buildings or similar occupancies for on-premises agricultural purposes

**NFPA 655-2012 Edition**

*Standard for Prevention of Sulfur Fires and Explosions*

Chapter 1 Administration

1.1 Scope.

1.1.1* This standard shall apply to the size reduction of sulfur and to the handling of sulfur in any form.

1.2 Purpose. The purpose of this standard shall be to provide requirements to eliminate or reduce the hazards of explosion and fire inherent in the processing and handling of sulfur.

**NFPA 664-2017 Edition**

*Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities*

Chapter 1 Administration

1.1 Scope. This standard provides the minimum requirements for fire and explosion prevention and protection of industrial, commercial, or institutional facilities that process wood or manufacture wood products, using wood or other cellulosic fiber as a substitute for or additive to wood fiber, and that process wood, creating wood chips, particles, or dust.

Additionally, the pointer to Chapter 22 is an incomplete reference which will cause confusion as this table is duplicated in the IBC and there is a SECTION [F] 426 COMBUSTIBLE DUSTS, GRAIN PROCESSING AND STORAGE in the IBC that must be applied to these operations which then points to the IFC.

There is a separate proposal being processed this cycle to improve Chapter 22 COMBUSTIBLE DUST-PRODUCING OPERATIONS of the IFC and Section 426 of the IBC dealing with combustible dusts as a first step to improving how the codes address the hazards. Moving forward additional linkage between the table and these sections of code needs to be developed, but at this time this proposal does not improve the code, it incorrectly indicates that storage activities do not present hazards.
Proposed Change as Submitted

Proponent: Ali Fattah, City of San Diego Development Services Department (afattah@sandiego.gov)

2015 International Fire Code

Revise as follows:

5003.8.3.2 (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 shall be in accordance with Table 5003.8.3.2. Each portion of a building separated by one or more fire walls that comply with the provisions of Section 706 of the International Building Code shall be considered a separate building where no openings are located in the fire wall.

Reason: This code change is necessary due to the recently approved Group A code G130-15 that modified Section 706.1. The intent of the code change was to remove scoping provisions from Ch 7 and for sections that permit the use of fire walls to reference the construction requirements in Ch 7. Additionally the reason statement for code change stated that code users were requiring that all utilities be separated since the separated buildings are considered separate buildings.

When the Building Code Action Committee proposed the code change in Group A Section 706.1.1 was left unchanged. Section 706.1.1 requires that a party wall to be constructed to comply with the requirements for fire walls however openings are prohibited through the wall. Two buildings sharing a common “party wall” on a lot line separating the two buildings can comply with what is being proposed in this code change with the Group A code change results.

A party wall is described as "Any wall located on a lot line between adjacent buildings, which is used or adapted for joint service between the two buildings, shall be constructed as a fire wall in accordance with Section 706. Party walls shall be constructed without openings and shall create separate buildings."

The proposed code change references Section 706 with a modifier specifically to ensure that:

1. The wall is constructed as is required as a Fire wall in the IBC and not as an area separation wall in a legacy code such as the Uniform Building Code.
2. No openings are permitted in the wall and as such the separation will be more reliable in that it will not include communicating openings that are frequently not maintained to function properly.

If the allowance in IBC Section 706.1.1.1 is used to create two separate buildings, then a total of 8 control areas would be allowed in a 1-story building. By permitting the application of fire walls in Section 706, with no openings, for control area purposes, that same building can still have 8 control areas, but 4 control areas will be separated from the other 4 by a fire wall wall which has a fire-resistance rating the same as a code permitted party.

This code change allows buildings with multiple tenants to eliminate the current need for multiple tenants to share a common control area. It makes it possible for tenants to have their own control area thereby improving the reliability of material use, handling and storage inventories since they will be under the control of one tenant and not the building owner. This will increase accountability. Prohibiting openings in the fire wall addresses concerns that fire doors may not be maintained and that transportation of hazardous materials between the buildings may violate materials inventory limitations based on the allowable quantities in the Ch 4 IBC tables. In the event of a fire, the fire wall protects the hazardous materials in one building from a fire on the fire side of the fire wall in the other building.

Cost Impact: Will not increase the cost of construction

This code change gives another tool to designers to design safe buildings where the use of hazardous materials is controlled.

Public Hearing Results

Committee Action: Disapproved

Committee Reason: This proposal was felt to be overly restrictive and would be a shift in the application of the code. Currently, the IBC and IFC allow openings in fire walls and still consider a building as two separate buildings. This proposal would prohibit this concept. This interferes with the operation of facilities and may actually increase the hazards based upon the need to exit the building fully to transfer materials to the adjacent "separate building."
Individual Consideration Agenda

Public Comment 1:

Proponent: Ali Fattah, City of San Diego Development Services Department, representing City of San Diego Development Services Department (afattah@sandiego.gov) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

5003.8.3.2 (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 shall be in accordance with Table 5003.8.3.2. Each portion of a building separated by one or more fire walls that comply with the provisions of Section 706 of the International Building Code shall be considered a separate building where no openings are located in the fire wall.

Commenter’s Reason: We are submitting this public comment to address the feedback provided by the committee and participants in the CAH. We deleted the limitation on the use of doors in the fire wall. This was initially added since it was felt that it would be controversial to include communicating openings, as became evident from the hearing we were in error on that issue.

This code change was submitted as a result of the Group A code change G130-15 that modified Section 706.1 so that fire walls do not create separate buildings for any reason. The code triggers the use of Fire Wall in chapters other than Chapter 7 and will refer to Section 706 for construction requirements as it does for the other wall types such as fire barriers etc. The fire wall Section 706 in the 2018 IBC will only be triggered in Ch 5 for purposes of allowable area limitation and to separate types of construction.

We stand on our original reason statement and request that membership study the rational for the code change. The committee did not disagree with the issue rather with how the issue is being addressed in the code change. Testimony in opposition shared the committees concerns and expressed no issues with the substance of the code change just the limitation on the use of doors.

F353-16
Committee Action: Disapproved

Assembly Action: None

Proposed Change as Submitted

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

2015 International Fire Code

Revise as follows:

5004.3 Ventilation. Indoor storage areas and storage buildings shall be provided with mechanical exhaust ventilation or natural ventilation where natural ventilation can be shown to be acceptable for the materials as stored.

Exceptions: Storage areas for flammable solids complying with Chapter 59.

2. Ventilation is not required in areas where flammable and combustible liquids are stored in containers and no dispensing is conducted.

Reason: This change is intended to correlate the provisions in the IFC to those in NFPA 30; Flammable & Combustible Liquids Code (currently referenced in the IFC). Currently the requirement for ventilation is found in Chapter 50; Hazardous Materials - General Provisions (Section 5004; Storage). As currently written, Section 5004 is applicable to the "Storage of hazardous materials in amounts exceeding the maximum allowable quantity per control area as set forth in Section 5003.1 shall be in accordance with Sections 5001, 5003 and 5004." Note it says "hazardous materials" - not specific types of hazardous materials, but ALL types of hazardous materials. The code change seeks to refine the provisions in Section 5004, and specifically 5004.6 to be applicable to the correct materials and conditions where the materials are used or stored.

When it comes to flammable and combustible liquids, the go-to document for anyone looking for the best regulations for storing flammable and combustible liquids - including the IFC - is NFPA 30. Years ago when NFPA 30 did not address flammable and combustible liquids as it does now, unfortunately it took several significant incidents to prompt the fire protection community to realize that changes had to be made to NFPA 30. The 2015 edition of NFPA 30 addresses the storage and dispensing of flammable and combustible liquids, and it is time that the IFC start to put more reliance on the content of NFPA 30 instead of trying to correlate the regulations in a piecemeal fashion.

The 2015 edition of NFPA 30; Flammable & Combustible Liquids Code, in Chapter 9 Storage of Liquids in Containers – General Requirements, and specifically in Section 9.14 states "Liquid storage areas where dispensing is conducted shall be provided with ventilation that meets the requirements of Section 18.6." With affirmation of this found in NFPA 30 Section 18.6 Ventilation for Dispersing Areas which reads " Liquid Storage areas where dispensing is conducted shall be provided with a gravity system or a continuous mechanical exhaust ventilation system. Mechanical ventilation shall be used if Class I liquids are dispensed within the room."

The proposed language makes it clear that ventilation is not required where flammable and/or combustible liquids are stored when dispensing is not conducted.

Cost Impact: Will not increase the cost of construction

The proposed change, if successful will decrease the cost of construction as the requirement for ventilation will be reduced.

Committee Reason: This proposal was disapproved as it removes all ventilation whether natural or mechanical for flammable liquids which did not appear justified.

Assembly Action: None

Public Hearing Results

Individual Consideration Agenda

Public Comment 1:

Proponent: Sarah Rice, representing Preview Group requests Approve as Modified by this Public Comment.

Modify as Follows:
2015 International Fire Code

5004.3 Ventilation. Indoor storage areas and storage buildings shall be provided with mechanical exhaust ventilation or natural ventilation where natural ventilation can be shown to be acceptable for the materials as stored.

Exceptions:
1. Exception: Storage areas for flammable solids complying with Chapter 59.
2. Ventilation is not required in areas where flammable and combustible liquids are stored in containers and no dispensing is conducted.

5004.3.1 System requirements. Exhaust ventilation systems shall comply with all of the following:
1. Installation shall be in accordance with the International Mechanical Code.
2. Mechanical ventilation shall be at a rate of not less than 1 cubic foot per minute per square foot \([0.00508 \text{ m}^3/(\text{s} \cdot \text{m}^2)]\) of floor area over the storage area.
3. Systems shall operate continuously unless alternative designs are approved.
4. A manual shutoff control shall be provided outside of the room in a position adjacent to the access door to the room or in an approved location. The switch shall be a break-glass or other approved type and shall be labeled: VENTILATION SYSTEM EMERGENCY SHUTOFF.
5. Exhaust ventilation shall be designed to consider the density of the potential fumes or vapors released. For fumes or vapors that are heavier than air, exhaust shall be taken from a point within 12 inches (305 mm) of the floor. For fumes or vapors that are lighter than air, exhaust shall be taken from a point within 12 inches (305 mm) of the highest point of the room.
6. The location of both the exhaust and inlet air openings shall be designed to provide air movement across all portions of the floor or room to prevent the accumulation of vapors.
7. Exhaust air shall not be recirculated to occupied areas if the materials stored are capable of emitting hazardous vapors and contaminants have not been removed. Air contaminated with explosive or flammable vapors, fumes or dusts; flammable, highly toxic or toxic gases; or radioactive materials shall not be recirculated.

**Exception:** An exhaust ventilation system meeting Items 1 through 7 is not required for inside storage areas and storage buildings in which flammable or combustible liquids are stored but not dispensed, and where the storage area or building is equipped with ventilation in accordance with the International Mechanical Code.

**Commenter’s Reason:** The intent of this code change is to recognize that when there is no dispensing of flammable or combustible liquids, there is not the need for the same robust level of ventilation, and that the ventilation requirements found in the International Mechanical Code (IMC) should govern.

As was correctly brought up by the testifiers at the Spring Hearings, the proposed exception was located in the wrong section to achieve the intended result. It was not ever the intent to exempt areas where there is no dispensing from having any level of ventilation, but rather when there is no dispensing the ventilation in these areas are governed by what is specified in the IMC. As outlined in the original reason statement, the parameter for a exhaust ventilation system found in Section 5004.3.1 are based on, and consistent with, those in Chapter 9 of NFPA 30 for areas where there is the dispensing of flammable or combustible liquids 9 (see below). This type of operation/process results in fumes being emitted into the atmosphere of the space, where storage without dispensing does not. is to allow those areas where flammable and combustible liquids are ONLY stored (no dispensing or pour-off) to be ventilated in accordance with the IMC. At the Spring Hearings there was no testimony or committee comments received which disagreed with the intent of the code change, only that the exception was located in the wrong section/location to achieve the intent.

The 2015 edition of NFPA 30; Flammable & Combustible Liquids Code, in Chapter 9 Storage of Liquids in Containers – General Requirements, and specifically in Section 9.14 states “Liquid storage areas where dispensing is conducted shall be provided with ventilation that meets the requirements of Section 18.6.” With affirmation of this found in NFPA 30 Section 18.6 Ventilation for Dispersing Areas which reads “Liquid Storage areas where dispensing is conducted shall be provided with a gravity system or a continuous mechanical exhaust ventilation system. Mechanical ventilation shall be used if Class I liquids are dispensed within the room.” [underlining is for emphasis only]

The proposed language makes it clear that the exhaust ventilation system specified in Section 5004.3.1 would not be required where flammable and/or combustible liquids are ONLY stored, and there is no dispensing being conducted. But that ventilation per the IMC must be provided.
Committee Action: Disapproved

Assembly Action: None

2015 International Fire Code

Revise as follows:

5301.1 Scope. Storage, use and handling of compressed gases in compressed gas containers, cylinders, tanks and systems shall comply with this chapter and NFPA 55, including those gases regulated elsewhere in this code. Partially full compressed gas containers, cylinders or tanks containing residual gases shall be considered as full for the purposes of the controls required.

Liquefied natural gas for use as a vehicular fuel shall also comply with NFPA 52 and NFPA 59A.

Compressed gases classified as hazardous materials shall also comply with Chapter 50 for general requirements and chapters addressing specific hazards, including Chapters 58 (Flammable Gases), 60 (Highly Toxic and Toxic Materials), 63 (Oxidizers, Oxidizing Gases and Oxidizing Cryogenic Fluids) and 64 (Pyrophoric Materials).

Compressed hydrogen (CH₂) for use as a vehicular fuel shall also comply with Chapters 23 and 58 of this code, the International Fuel Gas Code and NFPA 2.

Cutting and welding gases shall also comply with Chapter 35.

- Exceptions:
  1. Gases used as refrigerants in refrigeration systems (see Section 606).
  2. Compressed natural gas (CNG) for use as a vehicular fuel shall comply with Chapter 23, NFPA 52 and the International Fuel Gas Code.
  3. Cryogenic fluids shall comply with Chapter 55.
  4. LP-gas shall also comply with Chapter 61 and the International Fuel Gas Code.

Reason: Chapter 53 provides generic requirements for compressed gases. Liquefied petroleum gases are addressed in Chapter 61 and have specific requirements assigned to them. LP-gases should not be required to comply with Chapter 53. Requiring LP-gases to also comply with the provisions in Chapter 53 is often redundant and in the some cases leads to conflicting requirements. For example, the requirements in 5303.4 address container marking requirements and reference CGA Standard C-7. However, those requirements conflict with those in Chapter 61, which references NFPA 58 "LP-Gas Code" for the provisions that are not specified in Chapter 61. NFPA 58 does not reference CGA Standard C-7 for container marking requirements.

Much of Chapter 53 is not even applicable to the storing, handling and transportation of LP-gas. Rather than complicate the jobs of compliance and enforcement by including LP-gas in a chapter that is minimally applicable, the code user should be directed to the specific requirements contained in Chapter 61.

Cost Impact: Will not increase the cost of construction
This proposal will not increase the cost of construction and will simplify the enforcement of the code with respect to LP-gas.

Committee Reason: The committee disapproved this proposal as it was inappropriate to lose the applicability of Chapter 53 in its entirety to LPG vehicles.

Assembly Action: None

Proponent: Bruce Swiecicki, National Propane Gas Association, representing National Propane Gas Association (bswiecicki@npga.org) requests Approve as Submitted.

Commenter's Reason: The CAH reason for disapproval of the original proposal is not valid. LP-gas vehicles are not
addressed in Chapter 53. They are addressed in NFPA 58, which is referenced in Chapter 61. Continuing to require LP-gas to 
conform to requirements in Chapter 53 that are not applicable to LP-gas systems is not only unnecessary, it is inefficient 
causes confusion in the field as to what is and what is not applicable to LP-gas cylinder installations. Everything needed to 
address LP-gas cylinder installations is contained within Chapter 61 and by extension, NFPA 58.

F365-16
SECTION 5306 MEDICAL GASES

5306.1 General. Medical gases, gas storage at health care-related facilities intended for patient care, inhalation or sedation including, but not limited to, analgesia systems for dentistry, podiatry, veterinary and similar uses shall comply with Section 5306.2 through 5306.4 in addition to other requirements of this chapter and Section 427 of the International Building Code.

5306.2 Interior supply location. Medical Storage of medical gases shall be stored in areas dedicated to the storage of such gases without other storage or uses. Where containers of medical gases in quantities greater than the permit amount are located inside buildings, they shall be in a 1-hour exterior room, a 1-hour interior room or a gas cabinet in accordance with Section 5306.2.1, 5306.2.2 or 5306.2.3, respectively. Rooms or areas where medical gases are stored or used in quantities exceeding the maximum allowable quantity per control area as set forth in Section 5003.1 shall be in accordance with the International Building Code for high-hazard Group H occupancies.

5306.2.1 One-hour exterior rooms. A 1-hour exterior room shall be a room or enclosure separated from the remainder of the building by fire barriers constructed in accordance with Section 707 of the International Building Code or horizontal assemblies constructed in accordance with Section 711 of the International Building Code, or both, with a fire protection rating of not less than 1 hour. Openings between the room or enclosure and interior spaces shall be self-closing smoke- and draft-control assemblies having a fire protection rating of not less than 1 hour. Rooms shall have not less than one exterior wall that is provided with not less than two nonclosable louvered vents. Each vent shall have a minimum free opening area of 24.36 square inches (155 cm²) for each 1,000 cubic feet (28 m³) at normal temperature and pressure (NTP) of gas stored in the room and shall be not less than 72 square inches (465 cm²) in aggregate free opening area. One vent shall be within 6 inches (152 mm) of the floor and one shall be within 6 inches (152 mm) of the ceiling. Rooms shall be provided with not less than one automatic sprinkler to provide container cooling in case of fire.

5306.2.2 One-hour interior room. Where an exterior wall cannot be provided for the room, a 1-hour interior room or enclosure shall be provided and separated from the remainder of the building by fire barriers constructed in accordance with Section 707 of the International Building Code or horizontal assemblies constructed in accordance with Section 711 of the International Building Code, or both, with a fire protection rating of not less than 1 hour. Openings between the room or enclosure and interior spaces shall be self-closing smoke- and draft-control assemblies having a fire protection rating of not less than 1 hour. An automatic sprinkler system shall be installed within the room. The room shall be exhausted through a duct to the exterior. Supply and exhaust ducts shall be enclosed in a 1-hour-rated shaft enclosure from the room to the exterior. Approved mechanical ventilation shall comply with the International Mechanical Code and be provided at a minimum rate of 1 cubic foot per minute per square foot [0.00508 m³/(s · m²)] of the area of the room.

5306.2.3 Gas cabinets. Gas cabinets shall be constructed in accordance with Section 5003.8.6 and shall comply with the following:

1. Constructed of not less than 0.097 inch (2.5mm) No. 12ga steel.
2. Provided with self-closing limited access ports or noncombustible windows to give access to equipment controls.
3. Exhausted to the exterior through dedicated exhaust duct system installed in accordance with Chapter 5 of the International Mechanical Code.
4. Supply and exhaust ducts shall be enclosed in a one-hour rated shaft enclosure from the cabinet to the exterior. The average velocity of ventilation at the face of access ports or windows shall be not less than 200 feet per minute (1.02 m/s) with not less than 150 feet per minute (0.76 m/s) at any point of the access port or window.
5. They shall be connected to an exhaust system.
6. They shall be internally sprinklered.
7. Provided with an automatic sprinkler system internal to the cabinet.

5306.3 Exterior supply locations. Oxidizer medical gas systems located on the exterior of a building with quantities greater than the permit amount shall be located in accordance with Section 6304.2.1.

5306.4 Transfilling. Transfilling areas and operations including, but not limited to, ventilation and separation, shall comply with NFPA 99.

5306.5 Medical gas systems. Medical gas systems including, but not limited to, distribution piping, supply manifolds,
connections, pressure regulators and relief devices and valves, shall be installed in accordance with NFPA 99 and the general provisions of this chapter. Existing medical gas systems shall be maintained in accordance with the maintenance, inspection and testing provisions of NFPA 99 for medical gas systems.

**Reason:** In the Group A Committee Hearings in Long Beach, proposal G127 was approved as Modified by Public Comment. That proposal added the Medical Gas construction requirements found in the International Fire Code into the International Building Code. During this process we discovered the IFC code language did not provide clear direction on how to construct fire separation between gas storage rooms and the remainder of the building. This was corrected in G127. Per recommendation of the General Committee, this proposal is intended to provide consistency between the IBC and the IFC by adding the same clarifying language to the IFC. There are no substantive changes proposed to the requirements of IFC 5306.

**Cost Impact:** Will not increase the cost of construction
There is no change to the code requirements therefore no added cost.

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**Public Hearing Results**

**Committee Action:** Disapproved

**Committee Reason:** This proposal inappropriately limits the applicability of Section 5306.1 to storage. This would no longer address related requirements for use within Chapter 53.

**Assembly Action:** None

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**Individual Consideration Agenda**

**Public Comment 1:**

Proponent: Lee Kranz, City of Bellevue, Washington (lkranz@bellevuewa.gov); Maureen Traxler, representing City of Seattle Dept of Construction & Inspections (maureen.traxler@seattle.gov) requests Approve as Modified by this Public Comment.

Modify as Follows:

**2015 International Fire Code**

5306.1 General. Medical gas storage gases at health care-related facilities intended for patient care, inhalation or sedation including, but not limited to, analgesia systems for dentistry, podiatry, veterinary and similar uses shall comply with Sections 5306.2 through 5306.4 in addition to other requirements of this chapter and Section 427 of the International Building Code.

5306.2 Interior supply location. Storage of medical gases shall be located in areas dedicated to the storage of such gases without other storage or uses. Where containers of medical gases in quantities greater than the permit amount are located inside buildings, they shall be in a 1-hour exterior room, a 1-hour interior room or a gas cabinet in accordance with Section 5306.2.1, 5306.2.2 or 5306.2.3, respectively. Rooms or areas where medical gases are stored or used in quantities exceeding the maximum allowable quantity per control area as set forth in Section 5003.1 shall be in accordance with the International Building Code for high-hazard Group H occupancies.

5306.2.3 Gas cabinets. Gas cabinets shall be constructed in accordance with Section 5003.8.6 and shall comply with the following:

1. Constructed of not less than 0.097 inch (2.5mm) No. 12ga steel.
2. Provided with self-closing limited access ports or noncombustible windows to give access to equipment controls.
3. Exhausted to the exterior through dedicated exhaust duct system installed in accordance with Chapter 5 of the International Mechanical Code.
4. Supply and exhaust ducts shall be exhaust ducts shall be enclosed in a one-hour rated shaft enclosure from the cabinet to the exterior. The average velocity of ventilation at the face of access ports or windows shall be not less than 200 feet per minute (1.02 m/s) with not less than 150 feet per minute (0.76 m/s) at any point of the access port or window.
5. Provided with an automatic sprinkler system internal to the cabinet.

**Commenter’s Reason:** This proposal makes the Fire Code provisions related to the installation of medical gas systems in or adjacent to buildings consistent with the 2018 IBC. Code change G127-15 (for the 2018 IBC) places fire separation and construction requirements of medical gas systems in the building code where it is more likely to be reviewed by a building code reviewer for a building permit. Code change G127-15 was approved in Long Beach in the last Group A Cycle.
This public comment for F366-16 is in response to the Fire Code Committee's reason for disapproval and addresses testimony in opposition heard at the Group B Committee Action Hearings in Louisville. The Committee indicated that the proposal limits the applicability of IFC Section 5306.1 because the word “storage” had been added in Sections 5306.1 and 5306.2. This public comment deletes any new references to “storage” from the proposal, reverting back to the current code text.

There was also testimony about the need for construction supporting “supply and exhaust ducts in a one-hour rated shaft” connected to gas cabinets to be protected with fire-resistance rated construction. We have elected to justify this part of the original proposal based on exception #2 of IBC Section 707.5.1 which exempts the requirement to support 1-hour fire barriers in Type IIB, IIIB and VB construction. Section 707.5 is specifically referenced in Section 713.5 which regulates shaft enclosures. Section 713.5 says that shaft enclosures shall be constructed as fire barriers which are then specifically exempted in non-rated types of construction in IBC Section 707.5. Gas cabinets could easily be supported with rated construction in buildings of 1-hour or greater types of construction. In IMC Section 506.3.11 and 506.3.11.1 there are provisions that require commercial grease ducts serving a Type 1 hood to be in a “shaft enclosure”. Additionally, the proposed language in Section 5306.2.3 item #4 for gas cabinets is consistent with the 2nd to the last sentence in Section 5306.2.2 for one-hour interior rooms. To not include this same requirement for gas cabinets would create a breach of the required fire-resistance rated separation between gas cabinets and the remainder of the building.

To reduce redundancy, we have deleted items 1 & 2 from Section 5306.2.3 because those requirements are already contained in IFC Section 5003.8.6 which is referenced in the beginning of this section.

F366-16
Proposed Change as Submitted

Proponent: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com); Michael O’Brien representing the Fire Code Action Committee (FCAC@iccsafe.org)

SECTION 5307 CARBON DIOXIDE (CO₂) SYSTEMS USED IN BEVERAGE DISPENSING APPLICATIONS

Compressed gases not otherwise regulated

Add new text as follows:

5307.1 General. Compressed gases in storage or use not regulated by the material-specific provisions of Chapters 6, 54, 55 and 60 through 67, including asphyxiating, irritant and radioactive gases, shall comply with this section in addition to other requirements of this chapter.

5307.2 Ventilation. Indoor storage and use areas and storage buildings shall be provided with ventilation in accordance with the requirements of Section 5004.3. Where mechanical ventilation is provided, the systems shall be operational during such time as the building or space is occupied.

Exceptions:
1. Where an alarm system complying with Section 5307.2.1 is provided.
2. Carbon dioxide systems used in beverage dispensing applications shall comply with Section 5307.3.

5307.2.1 Alarm system. In rooms or areas not provided with ventilation in accordance with Section 5307.2, a gas detection system complying with Section 916 or, where approved, an oxygen depletion alarm system, either of which initiates audible and visible alarm signals in the room or area where sensors are installed, shall be provided.

5307.3 General. Carbon dioxide (CO₂) systems used in beverage dispensing applications. Carbon dioxide systems with more than 100 pounds (45.4 kg) of carbon dioxide used in beverage dispensing applications shall comply with Sections 5307.2 through 5307.5.2.

Delete without substitution:

5307.2 Permits. Permits shall be required as set forth in Section 105.6.

5307.3 Equipment. The storage, use, and handling of liquid carbon dioxide shall be in accordance with Chapter 53 and the applicable requirements of NFPA 55, Chapter 13. Insulated liquid carbon dioxide systems shall have pressure relief devices vented in accordance with NFPA 55.

5307.4 Protection from damage. Carbon dioxide systems shall be installed so the storage tanks, cylinders, piping and fittings are protected from damage by occupants or equipment during normal facility operations.

5307.5 5307.3.1 Required protection: Ventilation. Where carbon dioxide storage tanks, cylinders, piping and equipment are located indoors, rooms or areas containing carbon dioxide storage tanks, cylinders, piping and fittings and other areas where a leak of carbon dioxide can collect would be expected to accumulate shall be provided with either mechanical ventilation in accordance with the requirements of Section 5307.5.1 or an emergency alarm system 5004.3 and designed to maintain the room containing carbon dioxide at a negative pressure in accordance with the surrounding area.

Exception: A gas detection system complying with Section 5307.5.2 916 with an alarm activation threshold not exceeding 5,000 parts per million (9,000 mg/m³) shall be permitted in lieu of mechanical ventilation.

SECTION 5308 COMPRESSED GASES NOT OTHERWISE REGULATED

5308.1 General. Compressed gases in storage or use not regulated by the material-specific provisions of Chapters 6, 54, 55 and 60 through 67, including asphyxiating, irritant and radioactive gases, shall comply with this section in addition to other requirements of this chapter.

5308.2 Ventilation. Indoor storage and use areas and storage buildings shall be provided with mechanical exhaust ventilation or natural ventilation in accordance with the requirements of Section 5004.3 or 5005.1.9. Where mechanical ventilation is provided, the systems shall be operational during such time as the building or space is occupied.

SECTION 916 GAS DETECTION SYSTEM

916.1 Gas Detection Activation. Where a gas detection system is required elsewhere in this code, a gas detection alarm shall be initiated when any sensor detects a concentration of gas exceeding the following thresholds:
1. For flammable gases, a gas concentration exceeding 25 percent of the lower flammable limit (LFL).
2. For non-flammable gases, a gas concentration exceeding 1/2 of the IDLH, unless a different threshold is specified by the section of this code requiring gas detection.

Upon activation of a gas detection alarm, alarm signals or other required responses shall be as specified by the section of this code requiring a gas detection system. Audible and visible alarm signals associated with a gas detection alarm shall be distinctive from fire alarm and carbon monoxide alarm signals.

Reason: Sections 5307 and 5308 currently overlap because 5308 regulates all compressed gases that are not regulated by IFC Chapters 6, 54, 55 and 60 through 67. That would include CO2 used for beverage dispensing. Although 5307 might be given precedence over 5308 for CO2 used for beverage dispensing based on the “specific over general” rule that applies to conflicting regulations in the code, there is no reason for the code to create this ambiguity. It makes more sense to have the regulations for all asphyxiating gases in one section.

Accordingly, this proposal recommends consolidating Sections 5307 and 5308. In the process of consolidating the sections, the need for some additional revisions became evident, as follows:

1. Current Section 5308.2 (proposed herein to be moved to 5307.2) always requires that ventilation be provided for indoor storage and use areas and storage buildings. A new exception has been suggested that would allow substituting a detection and alarm system for ventilation, recognizing that this is actually a safer alternative for odorless gases. The proposal also recognizes, when approved by the fire official, use of an oxygen depletion alarm in lieu of gas detection, which is an alternative detection method sometimes used to protect environments at risk of exposure to high concentrations of asphyxiating gases. Clearly, it is better to warn of a pending hazardous situation vs. simply providing the prescriptively required 1 cfm/sqft ventilation, which may or may not be adequate to prevent onset of a hazardous concentration of fugitive gas depending on the leak scenario. Allowing detection and alarm in lieu of ventilation also recognizes that continuously operating exhaust fans are very inefficient from an energy conservation perspective, particularly when removing conditioned air that must be replaced by conditioned air.

2. Current Section 5307.2 has been proposed for deletion because it simply duplicates requirements in Section 5301.2, which require permits for all compressed gases to meet Section 105.6.

3. Current Section 5307.3 has been proposed for deletion because CO2 equipment is required to comply with Chapter 53 regardless of whether this section restates that fact. In addition, the references to NFPA 55 are not needed because Section 5301 already requires storage, use and handling of all compressed gases to comply with NFPA 55, except as modified by the IFC.

4. Current Section 5307.4 has been proposed for deletion because Section 5303.5.2 requires physical protection for all compressed gas containers, cylinders, tanks and systems that could be exposed to physical damage. The need to restate this for CO2 beverage dispensing systems, particularly in a different way, is not evident.

5. Current Section 5307.5 has been retained as new Section 5307.3.1 and editorially cleaned up. It has been retained, rather than relying on the general ventilation requirements in Section 5307.2 because the existing provisions for CO2 use for beverage dispensing operations have supplemental requirements to maintain the area at negative pressure vs. surrounding areas and because the alternative provisions allowing the use of gas detection in lieu of ventilation specify a unique alarm threshold for detectors.

Cost Impact: Will not increase the cost of construction
The proposal is largely a consolidation of existing requirements with editorial clarification. The proposed new options for using gas detection and alarm systems in lieu of ventilation systems are not mandatory and therefore have no cost impact since an owner can choose to not use them.

F369-16 : 5307- SHAPIRO12527

Public Hearing Results
Committee Action: Approved as Modified

Modification:

5307.5.1 Ventilation. Mechanical ventilation shall be in accordance with the International Mechanical Code and shall comply with all of the following:
1. Mechanical ventilation in the room or area shall be at a rate of not less than 1 cubic foot per minute per square foot of floor area (0.00508 m³/(s • m²)).
2. Exhaust shall be taken from a point within 12 inches (305 mm) of the floor.
3. The ventilation system shall be designed to operate at a negative pressure in relation to the surrounding area.

5307.5.2 Emergency alarm system. An emergency alarm system shall comply with all of the following:
1. Continuous gas detection shall be provided to monitor areas where carbon dioxide can accumulate.
2. The threshold for activation of an alarm shall not exceed 5,000 parts per million (9,000 mg/m³).
3. Activation of the emergency alarm system shall initiate a local alarm within the room or area in which the system is installed.

Committee Reason: This proposal was a good cleanup combining both sections and also agreed with the proponent's reason statement. The modification removes sections that were intended to be removed in the original proposal to correlate with the overall proposal.

Assembly Action: None

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Individual Consideration Agenda

Public Comment 1:

Proponent: Jeffrey Shapiro, International Code Consultants, representing Self (jeff.shapiro@intlcodeconsultants.com) requests Approve as Modified by this Public Comment.

Further Modify as Follows:

2015 International Fire Code

105.6.4 Carbon dioxide systems used in beverage dispensing applications. An operational permit is required for carbon dioxide systems used in beverage dispensing applications having more than 100 pounds of carbon dioxide.

105.6.9 Compressed gases. An operational permit is required for the storage, use or handling at normal temperature and pressure (NTP) of compressed gases in excess of the amounts listed in Table 105.6.9.

- Exception: Vehicles equipped for and using compressed gas as a fuel for propelling the vehicle.

<table>
<thead>
<tr>
<th>TABLE 105.6.9 PERMIT AMOUNTS FOR COMpressed GASES</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE OF GAS</td>
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<tr>
<td>-------------------------------------------</td>
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<tr>
<td>Carbon dioxide used in insulated liquid carbon dioxide beverage dispensing applications</td>
</tr>
<tr>
<td>Corrosive</td>
</tr>
<tr>
<td>Flammable (except cryogenic fluids and liquefied petroleum gases)</td>
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<tr>
<td>Highly toxic</td>
</tr>
<tr>
<td>Inert and simple asphyxiant (other than carbon dioxide used in insulated liquid carbon dioxide beverage dispensing applications)</td>
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<tr>
<td>Oxidizing (including oxygen)</td>
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<tr>
<td>Pyrophoric</td>
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<tr>
<td>Toxic</td>
</tr>
</tbody>
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For SI: 1 cubic foot = 0.02832 m³.

a. For carbon dioxide used in beverage dispensing applications, see Section 105.6.4.

5307.2 Ventilation. Indoor storage and use areas and storage buildings shall be provided with ventilation in accordance with the requirements of Section 5004.3. Where mechanical ventilation is provided, the systems shall be operational during such time as the building or space is occupied.

Exceptions:
1. Where an alarm system A gas detection system complying with Section 5307.2.1 is provided, shall be permitted in lieu of mechanical ventilation.
2. Carbon Areas containing insulated liquid carbon dioxide systems used in beverage dispensing applications shall comply with Section 5307.3.

5307.2.1 Alarm Gas detection system. No change to text.

5307.3 Carbon insulated liquid carbon dioxide (CO2) systems used in beverage dispensing applications. Carbon insulated liquid carbon dioxide systems with more than 100 pounds (45.4 kg) of carbon dioxide used in beverage dispensing applications shall comply with Section 5307.3.1.

5307.3.1 Ventilation Where insulated liquid carbon dioxide storage tanks, cylinders, piping and equipment are located indoors,
rooms or areas containing carbon dioxide storage tanks, cylinders, piping and fittings, equipment and other areas where a leak of carbon dioxide would be expected to accumulate shall be provided with mechanical ventilation in accordance with the requirements of Section 5004.3 and designed to maintain the room containing carbon dioxide at a negative pressure in relation to the surrounding area.

Exception: A gas detection system complying with Section 916 with an alarm activation threshold not exceeding 5,000 parts per million (9,000 mg/m³) shall be permitted in lieu of mechanical ventilation.

5307.2 Gas detection system Where ventilation is not provided in accordance with Section 5307.3.1, a gas detection system shall be provided in rooms or indoor areas and in below grade outdoor locations with insulated carbon dioxide systems. Carbon dioxide sensors shall be provided within 12 inches (305 mm) of the floor in the area where the gas would be expected to accumulate or other approved locations. The system shall be designed as follows.

1. Activate an audible and visible supervisory alarm at a normally attended location upon detection of a carbon dioxide concentration of 5,000 ppm (9,000 mg/m³).
2. Activate an audible and visible alarm within the room or immediate area where the system is installed upon detection of a carbon dioxide concentration of 30,000 ppm (54,000 mg/m³).

Commenter’s Reason: The revisions are clean-ups and clarifications of the original proposal, as detailed below.
1. Consolidate operational permit requirements for carbon dioxide beverage dispensing systems into Table 105.6.9 vs. having a separate operational permit requirement that is unique to beverage dispensing applications.
2. Sections 5307.2 and 5307.2.1 are revised to correct the “alarm” reference to “gas detection.” This corrects an oversight in the original proposal’s text. Text is also edited for clarity.
3. Sections 5307.3 and 5307.3.1 are revised to apply to insulated liquid systems for consistency with NFPA 55, Section 13.10.
4. Sections 5307.3.1 and 5307.3.2 are revised to provide more comprehensive requirements for gas detection systems, where used in lieu of ventilation for protection of insulated liquid carbon dioxide systems for beverage dispensing. The two threshold alarm ensures that occupants will be notified when there is an acute leak, but limits the notification to a supervisory signal when leakage at a chronic hazard level is detected.

This comment should be considered after any comments to F75-16.

Public Comment 2:
Proponent: Jeffrey Shapiro, International Code Consultants, representing Self (jeff.shapiro@intlcodeconsultants.com) requests Approve as Modified by this Public Comment.

Further Modify as Follows:
2015 International Fire Code

SECTION 916 - GAS DETECTION SYSTEM

916.1 916.8 Gas Detection Activation. System activation Where a gas detection system is required elsewhere in this code,
A gas detection alarm shall be initiated when any sensor detects a concentration of gas exceeding the following thresholds:
1. For flammable gases, a gas concentration exceeding 25 percent of the lower flammable limit (LFL).
2. For nonflammable gases, a gas concentration exceeding 1/2 of the IDLH, unless a different threshold is specified by the section of this code requiring gas detection.

Upon activation of a gas detection alarm, alarm signals or other required responses shall be as specified by the section of this code requiring gas detection. Audible and visible alarm signals associated with a gas detection alarm shall be distinctive from fire alarm and carbon monoxide alarm signals.

Commenter’s Reason: The proposed modifications are for correlation with the section numbering and terminology used in Code Change F75-16, which was recommended for Approval as Submitted by the IFC Code Development Committee. This code change will modify Section 916.8 in F75-16 to specify that the alarm activation threshold for a non-flammable gas will be 1/2 of the IDLH value unless the section of the code requiring gas detection specifies a different value, which is typically the case. This comment should be considered after any comments to F75-16.

Analysis: Note that if F75-16 is disapproved this PC would no longer be necessary.
Proposed Change as Submitted

Proponent: Michael O'Brian representing the Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code

Add new text as follows:

105.6.5 Carbon dioxide enrichment systems. An operational permit is required for carbon dioxide enrichment systems having more than 874 cu. ft. scf (100 pounds) of carbon dioxide.

**TABLE 105.6.9**

**PERMIT AMOUNTS FOR COMPRESSED GASES**

<table>
<thead>
<tr>
<th>TYPE OF GAS</th>
<th>AMOUNT (cubic feet at NTP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide enrichment systems</td>
<td>874 (100 lbs)</td>
</tr>
<tr>
<td>Corrosive</td>
<td>200</td>
</tr>
<tr>
<td>Flammable (except cryogenic fluids and liquefied petroleum gases)</td>
<td>200</td>
</tr>
<tr>
<td>Highly toxic</td>
<td>Any Amount</td>
</tr>
<tr>
<td>Inert and simple asphyxiant</td>
<td>6,000</td>
</tr>
<tr>
<td>Oxidizing (including oxygen)</td>
<td>504</td>
</tr>
<tr>
<td>Pyrophoric</td>
<td>Any Amount</td>
</tr>
<tr>
<td>Toxic</td>
<td>Any Amount</td>
</tr>
</tbody>
</table>

For SI: 1 cubic foot = 0.02832 m$^3$.

a. For carbon dioxide used in beverage dispensing applications, see Section 105.6.4.

Add new definition as follows:

**SECTION 202 DEFINITIONS**

**CARBON DIOXIDE ENRICHMENT SYSTEM** A system where carbon dioxide gas is intentionally introduced into an indoor environment, typically for the purpose of stimulating plant growth.

Add new text as follows:

908.8 Carbon dioxide enrichment systems. A gas detection system shall be provided in rooms and indoor areas in which carbon dioxide enrichment processes are located in accordance with Section 5308.3.4.

5308.3 Carbon dioxide enrichment systems. The design, installation and maintenance of carbon dioxide enrichment systems with more than 100 pounds (874 cu. feet scf) of carbon dioxide, or carbon dioxide enrichment systems with any quantity of carbon dioxide with remote fill connections shall comply with Sections 5308.3.1 through 5308.3.8.

5308.3.1 Permits. Permits shall be required as set forth in Section 105.6.5.

5308.3.2 Documentation. The following information shall be provided with the application for permit:

1. Total aggregate quantity of liquid CO2 in pounds or cubic feet at normal temperature and pressure.
2. Location and total volume of the room where the carbon dioxide enrichment operation will be conducted. Identify whether the room is at grade or below grade.
3. Location of containers relative to equipment, building openings and means of egress.
4. Manufacturer's specifications and pressure rating, including cut sheets, of all piping and tubing to be used.
5. A piping and instrumentation diagram that shows piping support and remote fill connections.
6. Details of container venting, including but not limited to vent line size, material and termination location.
7. Alarm and detection system and equipment, if applicable.
8. Seismic support for containers.

5308.3.3 Equipment. Pressure relief, vent piping, fill indicators, fill connections, vent terminations, piping system, and the storage, use, and handling of the carbon dioxide shall be in accordance with Chapter 53 and NFPA 55.

5308.3.4 Gas detection system. A continuous gas detection system shall be provided in the room or indoor area in which the carbon dioxide enrichment process is located, in the room or indoor area in which the container systems are located, and in areas where the heavier than air gas can congregate. Carbon dioxide sensors shall be provided within 12 inches (305 mm) of the floor in the area where the gas is most likely to accumulate or leaks are most likely to occur. The system shall be designed to detect and notify at a low level alarm and high level alarm.

2016 ICC PUBLIC COMMENT AGENDA
1. The threshold for activation of the low level alarm shall not exceed a carbon dioxide concentration of 5,000 ppm (9,000 mg/m³) Time Weighted Average (TWA) over 8 hours.
2. The threshold for activation of the high level alarm shall not exceed a carbon dioxide concentration of 30,000 ppm (54,000 mg/m³). When carbon dioxide is detected at the high level alarm, the system shall activate an audible and visible alarm in an approved location.

5308.3.4.1 System Activation. Activation of the low level gas detection system alarm shall automatically:
   1. Stop the flow of carbon dioxide to the piping system.
   2. Activate the mechanical exhaust ventilation system.
   3. Activate an audible and visible supervisory alarm signal at an approved location within the building.

Activation of the high level gas detection system alarm shall automatically:
   1. Stop the flow of carbon dioxide to the piping system.
   2. Activate the mechanical exhaust ventilation system.
   3. Activate an audible and visible evacuation alarm both inside and outside of the carbon dioxide enrichment area, and the area in which the carbon dioxide containers are located.

5308.3.5 Pressurization and ventilation. Rooms or indoor areas in which carbon dioxide enrichment is provided shall be maintained at a negative pressure in relation to the surrounding areas in the building. A mechanical ventilation system shall be provided in accordance with the *International Mechanical Code* that complies with all of the following:
   1. Mechanical ventilation in the room or area shall be at a rate of not less than 1 cubic foot per minute per square foot.
   2. When activated by the gas detection system the mechanical ventilation system shall remain on until manually reset.
   3. The exhaust system intakes shall be taken from points within 12 inches of the floor.
   4. The ventilation system piping shall terminate outdoors in an approved location.

5308.3.6 Signage. Hazard identification signs shall be posted at the entrance to the room and indoor areas where the carbon dioxide enrichment process is located, and at the entrance to the room or indoor where the carbon dioxide containers are located. The sign shall be a minimum 8 in. (200 mm) wide and 6 in. (150 mm) high and indicate:
   CAUTION – CARBON DIOXIDE GAS
   Ventilate the area before entering.
   A high carbon dioxide (CO₂) gas concentration in this area can cause asphyxiation.

5308.3.7 Seismic and structural design. Carbon dioxide system containers and piping shall comply with the seismic design requirements in Chapter 16 of the *International Building Code* and shall not exceed the floor loading limitation of the building.

5308.3.8 Container refilling. Carbon dioxide containers shall not be refilled indoors unless a remote fill connection is provided.

Reason: The number of indoor marijuana cultivation facilities is expanding rapidly across the country, and an increasing number of them are using carbon dioxide enrichment systems to stimulate plant growth. This is creating a potential asphyxiation hazard that is not currently regulated in codes or standards.

Jurisdictions where these processes are found are having to adopt local regulation to mitigate the asphyxiation hazard. The hazard is of particular concern because asphyxiant gas is intentionally being introduced into indoor occupiable rooms and areas.

The hazard is the same whether the systems use liquid insulated CO₂ system or CO₂ gas containers.

The proposal is based in part on Clark County, NV guidelines, and requirements proposed for protecting insulated liquid CO₂ systems. In particular:

The 100 lb. threshold is based on insulated liquid CO₂ threshold.

The definition was created to describe the system covered.

The two level gas detection system detection levels and activation criteria is based on Clark County and the FCAC insulated liquid CO₂ system proposal.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Cost Impact: Will increase the cost of construction
This proposal will require a gas detection system, ventilation system and the system installation to comply with requirements that are not currently in the code.

Public Hearing Results
Committee Action: Approved as Submitted
Committee Reason: This proposal that addresses CO2 enrichment was seen as necessary tool for regulation of an asphyxiation hazard. Currently the code does not address this hazard. The detection provided is adequate to provide safety to occupants.

Assembly Action: None

Individual Consideration Agenda
Public Comment 1:
Proponent: Jeffrey Shapiro, International Code Consultants, representing Self (jeff.shapiro@intlcodeconsultants.com) requests Approve as Modified by this Public Comment.

Modify as Follows:
2015 International Fire Code

<table>
<thead>
<tr>
<th>TYPE OF GAS</th>
<th>AMOUNT (cubic feet at NTP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide used in carbon dioxide enrichment systems</td>
<td>875 (100 lbs)</td>
</tr>
<tr>
<td>Corrosive</td>
<td>200</td>
</tr>
<tr>
<td>Flammable (except cryogenic fluids and liquefied petroleum gases)</td>
<td>200</td>
</tr>
<tr>
<td>Highly toxic</td>
<td>Any Amount</td>
</tr>
<tr>
<td>Inert and simple asphyxiant</td>
<td>6,000</td>
</tr>
<tr>
<td>Oxidizing (including oxygen)</td>
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<td>Any Amount</td>
</tr>
</tbody>
</table>

For SI: 1 cubic foot = 0.02832 m³.

105.6.5 Carbon dioxide enrichment systems. An operational permit is required for carbon dioxide enrichment systems having more than 874 cu. ft. scf (100 pounds) of carbon dioxide.

908.8 Carbon dioxide enrichment systems. A gas detection system shall be provided in rooms and indoor areas in which carbon dioxide enrichment processes are located in accordance with Section 5308.3.4.

5308.3.1 Permits. Permits shall be required as set forth in Section 105.6.5.

5307.1 General Compressed gases in storage or use not regulated by the material-specific provisions of Chapters 6, 54, 55
and 60 through 67, including asphyxiating, irritant and radioactive gases, shall comply with this section in addition to other requirements of this chapter.

Areas containing insulated liquid carbon dioxide systems used in beverage dispensing applications shall comply with Section 5307.3. Carbon dioxide enrichment systems shall comply with Section 5307.4. Areas other than those covered by Sections 5307.3 or 5307.4 shall comply with Section 5307.2.

5307.2 Ventilation Indoor storage and use areas and storage buildings shall be provided with ventilation in accordance with the requirements of Section 5004.3. Where mechanical ventilation is provided, the systems shall be operational during such time as the building or space is occupied.

Exception: A gas detection system complying with Section 5307.2.1 shall be permitted in lieu of mechanical ventilation.

5307.4 Carbon dioxide enrichment systems. The design, installation and maintenance of carbon dioxide enrichment systems with more than 100 pounds (874 cu. ft. or 45.4 kg) of carbon dioxide, or carbon dioxide enrichment systems with any quantity of carbon dioxide with having a remote fill connection, shall comply with Sections 5307.4.1 through 5307.4.8.

5307.4.1 Documentation. No change to text.

5307.4.2 Equipment. No change to text.

5307.4.3 Gas detection system.  A continuous gas detection system complying with Section 916 shall be provided in the room or indoor area in which the carbon dioxide enrichment process is located, in the room or indoor area in which the container systems are located, and in other areas where the heavier than air gas can congregate. Carbon dioxide sensors shall be provided within 12 inches (305 mm) of the floor in the area where the gas is most likely expected to accumulate or leaks are most likely to occur. The system shall be designed to detect and notify at a low level alarm and high level alarm as follows.

1. The threshold for activation of the low level alarm shall not exceed a carbon dioxide concentration of 5,000 ppm (9,000 mg/m3) Time Weighted Average (TWA) over 8 hours.
2. The threshold for activation of the high level alarm shall not exceed a carbon dioxide concentration of 30,000 ppm (54,000 mg/m3). When carbon dioxide is detected at the high level alarm, the system shall activate an audible and visible alarm in an approved location.

5307.4.3.1 System Activation. No change to text.

5307.4.4 Pressurization and ventilation. Rooms or indoor areas in which carbon dioxide enrichment is provided shall be maintained at a negative pressure in relation to the surrounding areas in the building. A mechanical ventilation system shall be provided in accordance with the International Mechanical Code that complies with all of the following:

1. Mechanical ventilation in the room or area shall be at a rate of not less than 1 cubic foot per minute per square foot.
2. When activated by the gas detection system the mechanical ventilation system shall remain on until manually reset.
3. The exhaust system intakes shall be taken from points within 12 inches of the floor.
4. The ventilation system piping shall terminate discharge to the outdoors in an approved location.

5307.4.5 Signage. No change to text.

5307.4.6 Seismic and structural design. No change to text.

5307.4.7 Container refilling. Carbon dioxide containers located indoors shall not be refilled indoors unless filled from a remote fill connection located outdoors.

Commenter's Reason: Revisions are primarily to correlate the formatting and numbering of F372-16 with F369-16. Additional revisions to the original proposal have been made for clarity and for consistency of text for provisions that are similar to those added carbon dioxide beverage dispensing systems under F369-16. Note that 908.8 of the original proposal is proposed for deletion for correlation with changes made by Code Change F75-16.

This comment should be considered after comments to F75-16 and F369-16. It is intended that the text in Code Change F372-16 for Sections 5307.1 and 5307.2 prevail over text in Code Change F369-16 if public comments to both code changes are successful.
Proposed Change as Submitted

Proponent: Vickie Lovell, InterCode Incorporated, representing 3M (vickie@intercodeinc.com)

2015 International Fire Code

Add new text as follows:

5703.6.2.1 Piping systems carrying combustible liquids. Piping systems carrying combustible liquids in buildings identified in Risk Categories III and IV by Table 1604.5 shall be protected with an approved assembly, or a fire-resistant pipe-protection system that has been tested in accordance with UL 1489. Where protected with a fire-resistant pipe-protection system, the system shall be installed as tested and in accordance with the manufacturer's installation instructions. The rating for such assemblies or systems shall be as required elsewhere in the code, but shall not be less than 2 hours.

Reference standards type: This reference standard is new to the ICC Code Books

Add new standard(s) as follows:
UL 1489-2015 Outline of Investigation for Fire Resistant Pipe Protection Systems Carrying Combustible Liquids

Reason: This proposal is intended to require piping systems carrying combustible liquids to be protected with an approved assembly that could be considered fire-resistant for not less than 2 hours in Risk Categories III and IV.

Products that could comply with the section are traditionally some variation of fire-resistance-rated horizontal or vertical shaft enclosures. As such, this proposal includes that option.

The proposal also includes the option of protecting the piping system using a fire-resistant pipe-protection system tested in accordance with UL 1489. The system shall be installed as tested and in accordance with the manufacturer's installation instructions. The as-tested portion of this requirement is consistent with the wording used in multiple sections for the International Building Code which uses tested designs, systems or assemblies to provide hourly ratings. Sections 714 and 715, covering Penetrations and Fire-resistant Joint Systems, respectively, are good examples. The installation instructions portion of this requirement is consistent with language added to Section 715, covering Fire-resistant Joint Systems during the just completed Group A Code Cycle.

UL 1489 addresses the fire-resistive performance of piping systems protected for an hourly rating. The Outline of Investigation compliments the two standards currently referenced in the International Fire Code for establishing fire-resistance ratings: ASTM E 119 and UL 263. The Outline of Investigation describes the same test equipment and same time-temperature fire exposure as ASTM E 119 and UL 263. However, the sample configuration has been written to specifically address pipe-protection systems. The Conditions of Acceptance follow the intent of ASTM E 119 and UL 263, but specifically address the performance requirements for fire-resistant pipe-protection systems. Specifically the Conditions of Acceptance requires 1) Resistance to the fire and hose stream exposure without developing openings in the pipe, 2) Preventing a temperature increase exceeding 325°F at any single point or 250°F at any cross section along the pipe, and 3) Prevention of fuel leakage.

UL recently published Outline of Investigation 1489. UL is currently in the process of converting Outline of Investigation 1489 into an ANSI/UL standard. It is anticipated that the new standard will be published in advance of the ICC Public Comment Hearings.

A similar proposal was recommended in Group A for high rise buildings. This proposal extends the requirement to other buildings in the two highest risk categories, which includes essential facilities where the operation of emergency and standby power is especially critical.

The proposal includes the requirement where the fuel lines are protected with a fire-resistant pipe-protection system. The system shall be installed as tested and in accordance with the manufacturer's installation instructions. The as-tested portion of this requirement is consistent with the wording used in multiple sections for the code which used tested designs, systems or assemblies to provide hourly ratings. Sections 714 and 715, covering Penetrations and Fire-resistant Joint Systems, respectively, are good examples. The installation instructions portion of this requirement are consistent with language added to Section 715, covering Fire-resistant Joint Systems during the just completed Group A Code Cycle.

Cost Impact: Will increase the cost of construction
This proposal will increase the cost of construction because it permits the use of proprietary systems that have been tested to an approved standard.

Public Hearing Results

Committee Action: Disapproved
Committee Reason: The proposal was disapproved as it was felt to be overly restrictive. In addition, the criteria is different however this was a similar concept addressed in code change proposal F79-16 which was disapproved.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Vickie Lovell, InterCode Incorporated, representing 3M (vickie@intercodeinc.com) requests Approve as Modified by this Public Comment.

Replace Proposal as Follows:

2015 International Fire Code

5703.6.6 Protection from fire exposure. Piping systems carrying combustible liquids required to be protected from fire exposure shall be protected with an approved assembly, or a fire-resistant pipe-protection system that has been tested in accordance with UL 1489. A fire-resistant pipe-protection system shall be installed as tested and in accordance with the manufacturer's installation instructions.

Reference standards type: This reference standard is new to the ICC Code Books

Add new standard(s) as follows:

Commenter's Reason: The Fire Code Development Committee recommended disapproval for this proposal because the original scope was overly-restrictive, and made all piping systems carrying combustible liquids required to be protected from fire exposure.

The proposal has been modified by this public comment, and does NOT require piping systems carrying combustible liquids to be protected from fire exposure. However, when another code, a standard, or a local jurisdiction requires a piping system carrying combustible liquids to be protected from fire exposure, this proposal would make appropriate, approved protection mandatory. It defines what should be approved as appropriate methods of protection, but does not make the requirement for protection from fire exposure mandatory.

Products that could comply with the section, when required, are traditionally some variation of fire-resistance-rated horizontal or vertical shaft enclosures, or a fire-resistant pipe-protection system tested in accordance with UL 1489. This section requires that such fire resistant systems that are tested to UL 1489 be installed in accordance with the manufacturer's installation instructions.

At the time of the ICC deadline for proposals in January 2016, this standard was a UL Outline of Investigation. Since that time, it has completed the ANSI consensus standard process.

F378-16
Proposed Change as Submitted

Proponent: Leslie Townzen, representing Medline (les@townzen-consulting.com)

2015 International Fire Code

Add new text as follows:

5704.3.4.1 Maximum allowable quantity per control area. For occupancies other than Group M wholesale and retail sales uses, indoor storage of flammable and combustible liquids shall not exceed the maximum allowable quantities per control area indicated in Table 5003.1.1(1) and shall not exceed the additional limitations set forth in this section.

For Group M occupancy wholesale and retail sales uses, indoor storage of flammable and combustible liquids shall not exceed the maximum allowable quantities per control area indicated in Table 5704.3.4.1(1).

Storage of hazardous production material flammable and combustible liquids in Group H-5 occupancies shall be in accordance with Chapter 27.

For Group S occupancy warehouses, indoor storage flammable and combustible liquids shall not exceed the maximum allowable quantities per control area indicated in Table 5704.3.4.1(2).

### TABLE 5704.3.4.1 5704.3.4.1(1)

**MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF FLAMMABLE AND COMBUSTIBLE LIQUIDS IN WHOLESALE AND RETAIL SALES OCCUPANCIES**

<table>
<thead>
<tr>
<th>TYPE OF LIQUID</th>
<th>MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA (gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sprinklered in accordance with footnote densities and arrangements</td>
</tr>
<tr>
<td>Class IA</td>
<td>60</td>
</tr>
<tr>
<td>Class IB, IC, II, and IIIA</td>
<td>7,500&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Class IIIB</td>
<td>Unlimited</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m<sup>2</sup>, 1 gallon = 3.785 L, 1 gallon per minute per square foot = 40.75 L/min/m<sup>2</sup>.

a. Control areas shall be separated from each other by not less than a 1-hour fire barrier.

b. To be considered as sprinklered, a building shall be equipped throughout with an approved automatic sprinkler system with a design providing minimum densities as follows:

1. For uncartoned commodities on shelves 6 feet or less in height where the ceiling height does not exceed 18 feet, quantities are those allowed with a minimum sprinkler design density of Ordinary Hazard Group 2.
2. For cartoned, palletized or racked commodities where storage is 4 feet 6 inches or less in height and where the ceiling height does not exceed 18 feet, quantities are those allowed with a minimum sprinkler design density of 0.21 gallon per minute per square foot over the most remote 1,500-square-foot area.
3. Where wholesale and retail sales or storage areas exceed 50,000 square feet in area, the maximum allowable quantities are allowed to be increased by 2 percent for each 1,000 square feet of area in excess of 50,000 square feet, up to not more than 100 percent of the table amounts. A control area separation is not required. The cumulative amounts, including amounts attained by having an additional control area, shall not exceed 30,000 gallons.

5704.3.4.2 Occupancy quantity limits. The following limits for quantities of stored flammable or combustible liquids shall not be exceeded:

1. Group A occupancies: Quantities in Group A occupancies shall not exceed that necessary for demonstration, treatment, laboratory work, maintenance purposes and operation of equipment, and shall not exceed quantities set forth in Table 5003.1.1(1).
2. Group B occupancies: Quantities in drinking, dining, office and school uses within Group B occupancies shall not exceed that necessary for demonstration, treatment, laboratory work, maintenance purposes and operation of equipment, and shall not exceed quantities set forth in Table 5003.1.1(1).
3. Group E occupancies: Quantities in Group E occupancies shall not exceed that necessary for demonstration, treatment, laboratory work, maintenance purposes and operation of equipment, and shall not exceed quantities set forth in Table 5003.1.1(1).
4. Group F occupancies: Quantities in dining, office, and school uses within Group F occupancies shall not exceed that necessary for demonstration, laboratory work, maintenance purposes and operation of equipment, and shall not exceed quantities set forth in Table 5003.1.1(1).
5. Group I occupancies: Quantities in Group I occupancies shall not exceed that necessary for demonstration, laboratory work, maintenance purposes and operation of equipment, and shall not exceed quantities set forth in Table
5003.1.1(1).

6. Group M occupancies: Quantities in dining, office, and school uses within Group M occupancies shall not exceed that necessary for demonstration, laboratory work, maintenance purposes and operation of equipment, and shall not exceed quantities set forth in Table 5003.1.1(1). The maximum allowable quantities for storage in wholesale and retail sales areas shall be in accordance with Section 5704.3.4.1.

7. Group R occupancies: Quantities in Group R occupancies shall not exceed that necessary for maintenance purposes and operation of equipment, and shall not exceed quantities set forth in Table 5003.1.1(1).

8. Group S occupancies: Quantities in dining and office uses within Group S occupancies shall not exceed that necessary for demonstration, laboratory work, maintenance purposes and operation of equipment, and shall not exceed quantities set forth in Table 5003.1.1(1). The maximum allowable quantities for storage in warehouse storage areas shall be in accordance with Section 5704.3.4.1.

<table>
<thead>
<tr>
<th>TYPE OF LIQUID</th>
<th>MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA (GALLONS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class IA</td>
<td>60</td>
</tr>
<tr>
<td>Class IB, IC, II, and IIIA</td>
<td>7,500&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Class IIA</td>
<td>Unlimited</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m², 1 gallon = 3.785 L, 1 gallon per minute per square foot = 40.75 L/min/m².

a. Control areas shall be separated from each other by not less than a 1-hour fire barrier.
b. To be considered as sprinklered, a building shall be equipped throughout with an approved automatic sprinkler system with a design providing minimum densities as follows:
   1. For uncartonned commodities on shelves 6 feet or less in height where the ceiling height does not exceed 18 feet, quantities are those allowed with a minimum sprinkler design density of Ordinary Hazard Group 2.
   2. For cartoned, palletized or racked commodities where storage is 4 feet 6 inches or less in height and where the ceiling height does not exceed 18 feet, quantities are those allowed with a minimum sprinkler design density of 0.21 gallon per minute per square foot over the most remote 1,500-square-foot area.
c. Where warehouse storage areas exceed 80,000 square feet in area, the maximum allowable quantities are allowed to be increased by 2 percent for each 1,000 square feet of area in excess of 80,000 square feet, up to a maximum of 100 percent of the table amounts. A control area separation is not required. The cumulative amounts, including amounts attained by having an additional control area, shall not exceed 30,000 gallons.

5704.3.7 Group S Warehouse Areas. Flammable and combustible liquids in Group S occupancy warehouse uses shall be in accordance with Sections 5704.3.7.1 through 5704.3.7.5.

5704.3.7.1 Container type. Containers for Class I liquids shall be metal.

   Exception: In buildings equipped throughout with an automatic sprinkler system, Class IB and Class IC liquids is allowed in nonmetallic containers, each having a capacity of 33 ounces (0.946 L) or less.

5704.3.7.2 Container capacity. Containers for Class I liquids shall not have a capacity greater than 1 gallon (19 L).

5704.3.7.3 Fire protection and storage arrangements. Fire protection and container storage arrangements shall be in accordance with the following:

   1. Storage on shelves shall not exceed 10 feet (1829 mm) in height, and shelving shall be metal.
   2. Storage on pallets or in piles greater than 4 feet 6 inches (1372 mm) in height, or where the ceiling exceeds 18 feet (5486 mm) in height, shall be protected in accordance with Table 5704.3.6.3(4), and the storage heights and arrangements shall be limited to those specified in Table 5704.3.6.3(2).
   3. Storage on racks greater than 4 feet 6 inches (1372 mm) in height, or where the ceiling exceeds 18 feet (5486 mm) in height shall be protected with an ESFR sprinkler systems.

5704.3.7.4 Storage plan. Where required by the fire code official, aisle and storage plans shall be submitted in accordance with Chapter 50.

Reason: This code change is being proposed to allow for Group S warehouse occupancies to have the same amount of flammable and combustible liquids as Group M occupancies with an increase in fire protection that is currently required for Group M occupancies. This code change request is being driven by companies that store sanitizers and that is the main flammable liquid within their storage.
The flammable liquids in the storage facility are primarily sanitizer products ranging in size and type. The entire product is individually packaged for consumer use in plastic containers not exceeding 33-fluid ounces. The individual containers are stored in the facility on pallets randomly distributed throughout the facility.

The hand sanitizers are not intended for consumption; therefore, the exemption permitted for alcoholic beverages with alcohol contents greater than 50% does not apply (though hand sanitizers are no more flammable than alcoholic beverages). These materials do comply with the individual container limitation, though they do not technically fall into the category for exemption. Until recently, sanitizer products have not been in similar demand to alcoholic beverages. As such, the issue of storing the materials practically has only recently been realized. The most recent editions of the Codes have started addressing hand sanitizers including an exception from the hazardous materials provisions for wall mounted hand rubs containing alcohol.

However, the storage of these materials is not specifically addressed in the latest editions of the codes.

The quantity limitations per the S occupancy have simply not caught up with those allowed for wholesale retail spaces compared to other occupancies. These spaces are permitted to store up to 30,000 gallons of flammable liquids in accordance with Table 5704.3.4.1 of the Fire Code in lieu of 240 gallons in accordance with the Table 5003.1.1(1) of the Fire Code. However, the increase in quantity limitations are not based on an increase in fire protection or life safety systems that are required (no additional requirements are outlined for retail spaces). In fact, the fire protection systems that can be like ESFR systems exceed those of most retail spaces.

The logic behind the increased capacity for retail operations is based upon the inherent need for retail occupancies to have larger quantities of stock available for purchase to operate effectively; this is exactly the same reason that most large Group S warehouses need this increase to be able to operate in an effective manner.

The only significant difference between a traditional wholesale retail store and the typical Group S facility is the restriction of public access. However, by restricting public access the occupant load of the space is lower than the occupant load of a traditional retail space. The occupant load factor used to determine the occupant load for a retail space on grade is 30 square feet per person, which is ten times denser than the occupant load factor associated with storage (300 square feet per person). As such, the calculated occupant load of a retail space is ten times greater than a storage space.

By restricting public access to the space, only staff is permitted in the storage area. Warehouse employees are trained to respond appropriately to a fire event and are familiar with the layout of the space, including aisles and exit paths. This combined with a lower occupant load significantly decreases the egress time for the occupants of the facility. As such, the storage space presents a lower life safety hazard than a traditional wholesale retail establishment. Property loss prevention is a larger factor than in a retail facility.

As stated above, although the storage space presents a lesser hazard to life than a retail establishment, a wholesale retailer is permitted to have a maximum of 30,000 gallons of Class IB and IC liquids. The maximum permitted quantity is ten times greater than the limit proposed for Group S warehouse facility.

The Building and Fire Codes recognize that to operate certain types of establishments, it is necessary to maintain a stock of specific products in excess of the maximum permitted control area quantities.

Retail establishments that sell alcoholic beverages require larger quantities of beverages than permitted for control areas.

To permit the sale of these materials, the codes exempt alcoholic beverages in retail and storage uses when packaged in individual containers not exceeding 1.3 gallons, regardless of the actual alcohol content. This includes alcoholic beverages that contain alcohol content of up to 90%.

Medicines, cosmetics, and foodstuff with an alcohol content of less than 50% are exempt as well.

However, medicines, cosmetics, and foodstuffs containing more than 50% alcohol are not exempt from the quantity limitation. The hand sanitizers have an alcohol content of more than 50%. The hand sanitizers are not intended for consumption; therefore, the exemption permitted for alcoholic beverages with alcohol contents greater than 50% does not apply (though hand sanitizers are no more flammable than alcoholic beverages). Some supplies materials do comply with the individual container limitation, though they do not technically fall into the category for exemption.

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However, the storage of these materials is not specifically addressed in the latest editions of the codes.

A facility is approximately 600,000 square feet in area with consumer sized products (less than 33 ounce containers) stored randomly throughout the floor. The total proposed quantity of consumer products classified as flammable IB and IC liquids is less than 15,000 gallons distributed over the entire 600,000 square feet. This equates to 0.025 gallons or 3.2 ounces of product per square foot.

By limiting the density of materials, the potential for a fire involving the total amount of flammable liquids is low due to the random distribution of pallets throughout the 600,000 square feet of storage area.
By limiting the density of materials, the potential for a fire involving the total amount of flammable liquids is low due to the random distribution of pallets throughout the 600,000 square feet of storage area.

Cost Impact: Will increase the cost of construction
To be able to store the increase amounts of flammable and combustible materials, the cost of the fire protection will be increased by the installation of higher demand systems, but this is voluntary because a Group S warehouse occupancy that does not want to store these amounts, then they will fall into the existing fire sprinkler demand tables that have been used before.

F380-16:
5704.3.4.1-
TOWNZEN12727

Public Hearing Results

Committee Action: Disapproved
Committee Reason: The proposal was disapproved as the storage allowed by this proposal may be in much larger bulk containers which is not consistent with what is currently allowed for wholesale and retail sales occupancies.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:
Proponent: Leslie Townzen, representing Medline Industries, Inc (les@townzen-consulting.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

5704.3.4.1 Maximum allowable quantity per control area. For occupancies other than Group M wholesale and retail sales uses, indoor storage of flammable and combustible liquids shall not exceed the maximum allowable quantities per control area indicated in Table 5003.1.1(1) and shall not exceed the additional limitations set forth in this section.

For Group M occupancy wholesale and retail sales uses, indoor storage of flammable and combustible liquids shall not exceed the maximum allowable quantities per control area indicated in Table 5704.3.4.1(1).

Storage of hazardous production material flammable and combustible liquids in Group H-5 occupancies shall be in accordance with Chapter 27.

For Group S Occupancy warehouses of Type IIB construction that exceed 80,000 square feet, the indoor storage flammable and combustible liquids shall not exceed the maximum allowable quantities per control area indicated in Table 5704.3.4.1(2)

<table>
<thead>
<tr>
<th>TYPE OF LIQUID</th>
<th>MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA (GALLONS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class IA</td>
<td>60</td>
</tr>
<tr>
<td>Class IB, IC, II, and IIIA</td>
<td>7,500</td>
</tr>
<tr>
<td>Class IIB</td>
<td>Unlimited</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m², 1 gallon = 3.785 L, 1 gallon per minute per square foot = 40.75 L/min/m².

a. Control areas shall be separated from each other by not less than a 1-hour fire barrier.
b. To be considered as sprinklered, a building shall be equipped throughout with an approved automatic sprinkler system with a design providing minimum densities as follows:
   1. For uncartoned commodities on shelves 6 feet or less in height where the ceiling height does not exceed 18 feet, quantities are those allowed with a minimum sprinkler design density of Ordinary Hazard Group 2.
   2. For cartoned, palletized or racked commodities where storage is 4 feet 6 inches or less in height and where the ceiling
c. Where warehouse storage areas exceed 80,000 square feet in area, the maximum allowable quantities are allowed to be increase by 2 percent for each 1,000 square feet of area in excess of 80,000 square feet, up to a maximum of 100 percent of the table amounts. A control area separation is not required. The cumulative amounts, including amounts attained by having an additional control areas, shall not exceed 30,000 gallons.

d. ESFR sprinkler systems equipped with fire pumps shall have emergency power.

5704.3.7.1 Container type. Containers for Class I liquids shall be metal.

Exception: In buildings equipped throughout with an ESFR automatic sprinkler system, Class IB and Class IC liquids is allowed in nonmetallic containers, each having a capacity of 33 ounces (0.946 L) or less.

Commenter's Reason: We would like to take a moment to briefly describe for you why we proposed increasing the storage of flammable and combustible liquids in a Group S warehouse in more detail than the hearing format allowed. While our submittal was laid out in much greater detail for the committee, we wanted to highlight the very critical key points in this discussion. Also, below is the original reasoning that was submitted for the code change.

- Sanitizer Demand
  - Recent public concerns about epidemic flu conditions (e.g., H1N1 virus)
  - Dramatic increase in advertising around the use of hand sanitizing soaps and wipes in order to decrease the spread of germs
  - Recommendation by the Centers for Disease Control (CDC) that all health care workers wash their hands before and after examining a patient

- Quantities Allowed under M Occupancy
  - MAQ for an "M" occupancy is 30,000 gallons of flammable liquids in accordance with Table 5704.3.4.1 of the Fire Code.
  - MAQ for "S" occupancy are 240 gallons of flammable liquids in accordance with Table 5003.1.1(1) of the Fire Code.

- Key Reasons a Distribution Center is Safer than a Big Box Retailer
  - Only allow trained employees in the space
    - Respond to a fire event
    - Familiar with space layout and exits
  - Occupant load 10 times less than for a retail space
  - Alarm for early notification for evacuation
  - Early Suppression Fast Response (ESFR)
  - Complete backup power
  - Building is a Type IIB
  - Roof assembly is of non-combustible metal material
  - Hose stations located throughout the facility

- Our code change proposal and key factors required to meet it
  - Dramatic increase in demand for sanitizers
  - Codes have not specifically addressed the materials
  - Total proposed quantity of product per square foot is 0.050 gallons or 6.4 ounces
  - Limiting the density of flammable product
  - Greatly diminished potential for fire
  - Occupant load is less therefore less chance for loss of life

- Increased the fire protection
  - Limited to buildings greater than 80,000 sq. ft. and of Type IIB or greater construction.
  - Buildings with ESFR systems shall have back-up power
  - Can only have non-metallic containers in buildings with ESFR systems.

This code change is being proposed to allow for Group S warehouse occupancies to have the same amount of flammable and combustible liquids as Group M occupancies with an increase in fire protection that is currently required for Group M occupancies.

This code change request is being driven by companies that store sanitizers and that is the main flammable liquid within their storage. Without this code change, these types of occupancies would then need to be classified as a Group "H" occupancy even though their storage amount is less than what is allowed for a Group "M" occupancy.
The flammable liquids in the storage facility are primarily sanitizer products ranging in size and type. The entire product is individually packaged for consumer use in plastic containers not exceeding 33-fluid ounces. The individual containers are stored in the facility on pallets randomly distributed throughout the facility.

The hand sanitizers are not intended for consumption; therefore, the exemption permitted for alcoholic beverages with alcohol contents greater than 50% does not apply (though hand sanitizers are no more flammable than alcoholic beverages). These materials do comply with the individual container limitation, though they do not technically fall into the category for exemption. Until recently, sanitizer products have not been in similar demand to alcoholic beverages. As such, the issue of storing the materials practically has only recently been realized. The most recent editions of the Codes have started addressing hand sanitizers including an exception from the hazardous materials provisions for wall mounted hand rubs containing alcohol. However, the storage of these materials is not specifically addressed in the latest editions of the codes.

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By limiting the density of materials, the potential for a fire involving the total amount of flammable liquids is low due to the random distribution of pallets throughout the 600,000 square feet of storage area.
Dispensing of Class I, Class II and III motor vehicle fuel from tank vehicles into the fuel tanks of motor vehicles located in commercial parking lots of commercial, industrial, governmental or manufacturing establishments is allowed or other locations where permitted, provided such dispensing operations are conducted in accordance with the following:

1. Dispensing shall occur only at sites that have been issued a permit to conduct mobile fueling.
2. The owner of a mobile fueling operation shall provide to the jurisdiction a written response plan which demonstrates readiness to respond to a fuel spill and carry out appropriate mitigation measures, and describes the process to dispose properly of contaminated materials.
3. A detailed site plan shall be submitted with each application for a permit. The site plan shall indicate: all buildings, structures and appurtenances on site and their use or function; all uses adjacent to the lot lines of the site; the locations of all storm drain openings, adjacent waterways or wetlands; information regarding slope, natural drainage, curbing, impounding and how a spill will be retained upon the site property; and the scale of the site plan. Provisions shall be made to prevent liquids spilled during dispensing operations from flowing into buildings or off-site. Acceptable methods include, but shall not be limited to, grading driveways, raising doorsills or other approved means.
4. The fire code official is allowed to impose limits on the times and days during which mobile fueling operations is allowed to take place, and specific locations on a site where fueling is permitted.
5. Mobile fueling operations shall be conducted in areas not accessible to the public or shall be limited to times when the public is not present.
6. Mobile fueling shall not take place within 15 feet (4572 mm) of buildings, property lines, combustible storage or storm drains.
   ◆ Exceptions:
   1. The distance to storm drains shall not apply where an approved storm drain cover or an approved equivalent that will prevent any fuel from reaching the drain is in place prior to fueling or a fueling hose being placed within 15 feet (4572 mm) of the drain. Where placement of a storm drain cover will cause the accumulation of excessive water or difficulty in conducting the fueling, such cover shall not be used and the fueling shall not take place within 15 feet (4572 mm) of a drain.
   2. The distance to storm drains shall not apply for drains that direct influent to storm drains.
9. All tanks containing Class I fuel must meet DOT regulations.
10. The tank vehicle shall comply with the requirements of NFPA 385 and local, state and federal requirements. The tank vehicle's specific functions shall include that of supplying fuel to motor vehicle fuel tanks. The vehicle and all its equipment shall be maintained in good repair.
11. Signs prohibiting smoking or open flames within 25 feet (7620 mm) of the tank vehicle or the point of fueling shall be prominently posted on three sides of the vehicle including the back and both sides.
12. A portable fire extinguisher with a minimum rating of 40:BC shall be provided on the vehicle with signage clearly indicating its location.
13. The dispensing nozzles and hoses shall be of an approved and listed type.
14. The dispensing hose shall not be extended from the reel more than 100 feet (30 480 mm) in length.
15. Absorbent materials, nonwater-absorbent pads, a 10-foot-long (3048 mm) containment boom, an approved container with lid and a nonmetallic shovel shall be provided to mitigate a minimum 5-gallon (19 L) fuel spill.
16. Tank vehicles shall be equipped with a “fuel limit” switch such as a count-back switch, to limit the amount of a single fueling operation to not more than 500 gallons (1893 L) before resetting the limit switch.
   ◆ Exception: Tank vehicles where the operator carries and can utilize a remote emergency shutoff device which, when activated, immediately causes flow of fuel from the tank vehicle to cease.
17. Persons responsible for dispensing operations shall be trained in the appropriate mitigating actions in the event of a fire, leak or spill. Training records shall be maintained by the dispensing company.
18. Operators of tank vehicles used for mobile fueling operations shall have in their possession at all times an emergency communications device to notify the proper authorities in the event of an emergency.
19. The tank vehicle dispensing equipment shall be constantly attended and operated only by designated personnel who are trained to handle and dispense motor fuels.
20. Fuel dispensing shall be prohibited within 25 feet (7620 mm) of any source of ignition.
21. The engines of vehicles being fueled shall be shut off during dispensing operations.
22. Nighttime fueling operations shall only take place in adequately lighted areas.
23. The tank vehicle shall be positioned with respect to vehicles being fueled to prevent traffic from driving over the delivery hose.
24. During fueling operations, tank vehicle brakes shall be set, chock blocks shall be in place and warning lights shall be in operation.
25. Motor vehicle fuel tanks shall not be topped off.
26. The dispensing hose shall be properly placed on an approved reel or in an approved compartment prior to moving the tank vehicle.
27. The fire code official and other appropriate authorities shall be notified when a reportable spill or unauthorized discharge occurs.
28. Operators shall place a drip pan or an absorbent pillow under each fuel fill opening prior to and during dispensing operations. Drip pans shall be liquid-tight. The pan or absorbent pillow shall have a capacity of not less than 3 gallons (11.36 L). Spills retained in the drip pan or absorbent pillow need not be reported. Operators, when fueling, shall have on their person an absorbent pad capable of capturing diesel fuel overfills. Except during fueling, the nozzle shall face upward and an absorbent pad shall be kept under the nozzle to catch drips. Contaminated absorbent pads or pillows shall be disposed of regularly in accordance with local, state and federal requirements.
29. Operators of tank vehicles used for mobile fueling operations of Class I fuels shall:
   Be a minimum of 5 feet away from any electrical equipment.
   Tank vehicles will comply with the requirements of NFPA 385.
   Train and certify all delivery vehicle operators according to DOT Hazardous materials Regulations.
   Create policy and procedures manuals to ensure safe operations. Manuals will be available on demand to the fire code official. Each manual will include the following sections:
   1. Employee training log
   2. Cell phone policy
   3. Inclement weather driving instructions
   4. Fatigue prevention
   5. Seatbelt use
   6. Lightning procedures
   7. Railroad crossing procedures
   8. Drug and Alcohol Safety Training Program
   9. Vehicle Maintenance Log
   10. Daily and weekly safety checklist

5706.6.1 Operation of tank vehicles. Tank vehicles shall be utilized and operated in accordance with NFPA 385 and Sections 5706.6.1.1 through 5706.6.1.12.
5706.6.12 Mobile fueling location. Mobile fueling operations shall not be conducted on a public street. Mobile fuel operations shall be limited to private surface parking lots where such operations have been by authorized by the owner or the owners authorized agent. Fueling operations will cease where pedestrians encroach closer that 8 feet to a vehicle receiving fuel.

Reference standards type: This is an update to reference standard(s) already in the ICC Code Books
Add new standard(s) as follows:
Chapter 57 Fire code

Reason: There is a current trend emerging in Texas and California and other states involving the concept of mobile fueling based on community oriented demand for services. Some local AHJ's are reluctant to act upon this concept of fuel delivery due to lack of guidance in the fire code, other AHJ's are approving the concept based upon an alternative means of compliance. In other areas, it is being outright prohibited, which is creating an inconsistent pattern.
These amendments are intended to provide Fire Departments with the guidance needed to evaluate planned operations for mobile delivery of Class I fuel. These amendments are designed to place requirements on service companies to demonstrate a sound and safe approach with the intent of obtaining an operational permit to begin delivery.

According to the commentary provided by the committee responsible for IFC Chapter 57 on Flammable Liquids, mobile fueling has no know adverse incident history associated with it. Many corporations have been increasing operations related to mobile fueling since the initial adoption of mobile fueling standards. Bus companies, delivery companies and the US Postal service all rely on mobile refueling to keep their fleets moving. This industry- including Class I fuels is estimated to be growing 30% per year. In addition, service companies are currently providing safe delivery of Class I fuel in Texas under an alternative methods
operational permit with strong safety measures in place and a perfect safety record related to spill prevention and fire safety. No incidents have occurred to date. Given the length of time that mobile fueling has been occurring, the data points to an outstanding safety record. There is no safety related reason that mobile fueling operations should not be allowed, provided such operations are carried out in keeping with reasonable safety requirements to protect people, places and the environment.

States such as Texas, Nevada and Oregon have already amended their fire codes to allow for mobile fueling with Class I fuels. No negative consequences have arisen from such activities and with a significant amount of above average wage jobs being created.

Based upon the requirements set forth in the IFC, NFPA 30A and NFPA 385, the additional items listed in this amendment in conjunction with IFC Chapter 57 provide a jurisdiction with the information needed to authorize the delivery of Class I fuel from tank vehicles to other vehicles in approved locations.

There is no cost impact to a jurisdiction. All costs are recovered through Operational Permit Fees and vehicle inspection/permit fees.

Cost Impact: Will not increase the cost of construction
This proposal relies on fees set by each jurisdiction to recover any costs. Each jurisdiction will set their own fee schedule. In the locations this activity currently takes place, fees average $400.00 for each site plan reviewed and from $0 - 200.00 for each vehicle requiring a permit. The site review averages 1.25 hours and vehicle reviews average .75 hours. It could be assumed that this proposal is revenue neutral to profit generating but not an unfunded cost to a jurisdiction.

Public Hearing Results

Committee Action: Disapproved
Committee Reason: There was general concern with the entire concept. It appears that grounding and bonding not addressed. This concept has not yet been addressed for stationary fueling in these locations should not be allowed for these applications. Also, the requirements should address the prohibition of fueling at residential occupancies.

Assembly Action: None

Public Comment 1:
Proponent: Andrew Henning, CAL FIRE - Office of the State Fire Marshal, representing CAL FIRE - Office of the State Fire Marshal (andrew.henning@fire.ca.gov); Andrew Klein, Energy Code Specialist, representing Booster Fuels (andrew@asklein.com); Lynne Kilpatrick, Sunnyvale Department of Public Safety, representing California Fire Chiefs Association (lkilpatrick@sunnyvale.ca.gov) requests Approve as Modified by this Public Comment.
Replace Proposal as Follows:

2015 International Fire Code

SECTION 5707 ON-DEMAND MOBILE FUELING OPERATIONS

5707.1 General. On-demand mobile fueling operations that dispense Class I, II, and III liquids into the fuel tanks of motor vehicles shall comply with Sections 5707.1 through 5707.6.3.

Exception: Fueling from an approved portable container in cases of an emergency or for personal use.

5707.1.1 Approval required. Mobile fueling operations shall not be conducted without first obtaining a permit and approval from the fire code official. Mobile fueling operations shall occur only at approved locations.

5707.2 Mobile fueling vehicle. An on-demand mobile fueling vehicle shall be one of the following:
1. A vehicle that has chassis-mounted tanks or containers where the aggregate cargo capacity does not exceed 1200 gallons (4592 L). A mobile fueling vehicle with a mounted tank in excess of 110 gallons (415 L) shall comply with the requirements of Section 5706.6, Section 5707, and NFPA 385.
2. A vehicle that carries a maximum of 60 gallons (227 L) of motor fuel in metal safety cans listed in accordance with UL 30 or other approved metal containers each not to exceed 5 gallons (19 L) in capacity. Containers shall be secured to
The mobile fueling vehicle shall comply with the requirements of all local, state and federal requirements. The mobile fueling vehicle and its equipment shall be maintained in good repair.

5707.3 Required documents. Documents developed to comply with Sections 5707.3.1 through 5707.3.3 shall be updated as necessary by the owner of the mobile fueling operation and shall be maintained in compliance with Section 107.3.

5707.3.1 Safety and emergency response plan. Mobile fueling operators shall have an approved written safety and emergency response plan that establishes policies and procedures for fire safety, spill prevention and control, personnel training and compliance with other applicable requirements of this code.

5707.3.2 Training records. Mobile fueling vehicles shall be operated only by designated personnel who are trained on proper fueling procedures and the safety and emergency response plan. Training records of operators shall be maintained.

5707.3.3 Site plan. Where required by the fire code official, a site plan shall be developed for each location at which mobile fueling occurs. The site plan shall be in sufficient detail to indicate: all buildings, structures, lot lines, property lines, and appurtenances on site and their use or function; all uses adjacent to the lot lines of the site; fueling locations, the locations of all storm drain openings, and adjacent waterways or wetlands; information regarding slope, natural drainage, curbing, impounding and how a spill will be retained upon the site property; and the scale of the site plan.

5707.4 Mobile fueling areas. Mobile fueling shall not occur on public streets, public ways, or inside buildings. Fueling on the roof level of parking structures or other buildings is prohibited.

5707.4.1 Separation. Mobile fueling shall not take place within 25 feet (7620 mm) of buildings, property lines, or combustible storage.

   Exception: The fire code official shall be authorized to decrease the separation distance for dispensing from metal safety cans or other approved metal containers in accordance with Section 5707.2.

When dispensing operations occur within 15 feet (4572 mm) of a storm drain, an approved storm drain cover or an approved equivalent method that will prevent any fuel from reaching the drain shall be used.

5707.4.2 Sources of ignition. Smoking, open flames, and other sources of ignition shall be prohibited within 25 feet (7620 mm) of fuel dispensing activities. Signs prohibiting smoking or open flames within 25 feet (7620 mm) of the vehicle or the point of fueling shall be prominently posted on the mobile fueling vehicle. The engines of vehicles being fueled shall be shut off during fueling.

5707.5 Equipment. Mobile fueling equipment shall comply with Sections 5707.5.1 through 5707.5.4.

5707.5.1 Dispensing hoses and nozzles. Where equipped, the dispensing hose shall not exceed 50 feet (15 240 mm) in length. The dispensing nozzles and hoses shall be of an approved and listed type.

5707.5.2 Fuel limit. Mobile fueling vehicles shall be equipped with a fuel limit switch set to a maximum of 30 gallons (116 L) and a nozzle or other approved device that, when activated, immediately causes flow of fuel from the mobile fueling vehicle to cease.

5707.5.3 Fire extinguisher. An approved portable fire extinguisher complying with Section 906 with a minimum rating of 40-B:C shall be provided on the mobile fueling vehicle with signage clearly indicating its location.

5707.5.4 Spill kit. Mobile fueling vehicles shall contain a minimum 5 gallon (19 L) spill kit of an approved type.

5707.6 Operations. Mobile fueling vehicles shall be constantly attended during fueling operations with brakes set and warning lights in operation. Mobile fueling vehicles shall not obstruct emergency vehicle access roads.

5707.6.1 Dispensing hose. Where equipped, mobile fueling vehicles shall be positioned in a manner to preclude traffic from driving over the dispensing hose. The dispensing hose shall be properly placed on an approved reel or in an approved compartment prior to moving the mobile fueling vehicle.

5707.6.2 Drip control. Operators shall place a drip pan or an absorbent pillow under the nozzle to catch drips and under each fuel fill opening prior to and during dispensing operations.

5707.6.3 Spill reporting. Spills shall be reported in accordance with Section 5003.3.1.

105.6.17 Flammable and combustible liquids. An operational permit is required:

1. To use or operate a pipeline for the transportation within facilities of flammable or combustible liquids. This requirement shall not apply to the off-site transportation in pipelines regulated by the Department of Transportation (DOTn) nor does it apply to piping systems.

2. To store, handle or use Class I liquids in excess of 5 gallons (19 L) in a building or in excess of 10 gallons (37.9 L) outside of a building, except that a permit is not required for the following:

   2.1 The storage or use of Class I liquids in the fuel tank of a motor vehicle, aircraft, motorboat, mobile power plant
or mobile heating plant, unless such storage, in the opinion of the fire code official, would cause an unsafe condition.

2.2. The storage or use of paints, oils, varnishes or similar flammable mixtures where such liquids are stored for maintenance, painting or similar purposes for a period of not more than 30 days.

3. To store, handle or use Class II or Class IIIA liquids in excess of 25 gallons (95 L) in a building or in excess of 60 gallons (227 L) outside a building, except for fuel oil used in connection with oil-burning equipment.

4. To store, handle or use Class IIIB liquids in tanks or portable tanks for fueling motor vehicles at motor fuel-dispensing facilities or where connected to fuel-burning equipment.
   **Exception:** Fuel oil and used motor oil used for space heating or water heating.

5. To remove Class I or II liquids from an underground storage tank used for fueling motor vehicles by any means other than the approved, stationary on-site pumps normally used for dispensing purposes.

6. To operate tank vehicles, equipment, tanks, plants, terminals, wells, fuel-dispensing stations, refineries, distilleries and similar facilities where flammable and combustible liquids are produced, processed, transported, stored, dispensed or used.

7. To place temporarily out of service (for more than 90 days) an underground, protected above-ground or above-ground flammable or combustible liquid tank.

8. To change the type of contents stored in a flammable or combustible liquid tank to a material that poses a greater hazard than that for which the tank was designed and constructed.

9. To manufacture, process, blend or refine flammable or combustible liquids.

10. To engage in the dispensing of liquid fuels into the fuel tanks of motor vehicles at commercial, industrial, governmental or manufacturing establishments in accordance with Section 5706.5.4 or to engage in on-demand mobile fueling operations in accordance with Section 5707.

11. To utilize a site for the dispensing of liquid fuels from tank vehicles into the fuel tanks of motor vehicles, marine craft and other special equipment at commercial, industrial, governmental or manufacturing establishments in accordance with Section 5706.5.4 or, where required by the fire code official, to utilize a site for on-demand mobile fueling operations in accordance with Section 5707.

**Commenter's Reason:**
This Public Comment is designed to regulate on-demand mobile fueling operations, vehicles and equipment by authorizing the fire code official to permit operations and individual sites. This Public Comment provides a code compliant path for on-demand mobile fueling and provides the fire code official the explicit authority to regulate such operations while leaving current mobile fleet fueling requirements unchanged.

On-demand mobile fueling is an emerging industry that has had significant consumer demand both nationally and internationally. The practice is already occurring—both regulated and unregulated—and codification in the national code is imperative to ensure safe, consistent regulation of the operation.

This Public Comment was developed by the California State Fire Marshal's Office Mobile Fueling Task Force - IFC Subgroup, comprised of fire code officials, industry stakeholders, and interested parties.
**Proposed Change as Submitted**

**Proponent**: Bruce Swiecicki, representing National Propane Gas Association (bswiecicki@npga.org)

2015 International Fire Code

Revise as follows:

6103.2.1.1 Use in basement, pit or similar location. LP-gas containers shall not be used in a basement, pit or similar location where heavier-than-air gas might collect. LP-gas containers shall not be used in an above-grade underfloor space or basement unless such location is provided with an approved means of ventilation.

**Exception**: Use with self-contained torch assemblies in accordance with Section 6103.2.1.6.

**Reason**: The requirement to ban the use of LP-Gas in basements and below grade spaces is an obsolete remnant from the old Uniform Fire Code. It was removed from the Uniform Plumbing and Uniform Mechanical Codes in the 2000 editions of each of those codes. The popular misconception is that since propane is 1.5 times heavier than air, that it immediately sinks to the ground and “pools.”

This is not the case as the physics of Brownian motion and thermal dispersion are sufficient to allow propane to mix throughout the room, although it is likely that if the release into the room was from liquid vaporizing, the temperature of the propane would be colder than ambient and therefore its density would be greater. It can be dangerous to assume that all the propane pools at the floor level.

LP-gas powered forklifts, man-lifts, floor buffers, and other equipment have been used successfully inside commercial and industrial occupancies for many years. This equipment is powered by a 33 lb. DOT cylinder that is subject to strict maintenance and filling requirements. Often, these buildings will have floor space that is partially or completely below-grade, or will have overhead occupied areas. This requirement eliminates the use of LP-gas powered equipment in these occupancies due to the misconception about the behavior of propane. It is worth noting that there is no similar prohibition in NFPA 58.

The requirement as written is confusing. The first sentence prohibits use of LP-gas in all basements. The second sentence allows its use where there is an approved means of ventilation. It is sufficient to rely upon a ventilation system that is designed according to the mechanical code based on the occupancy and use of the space without any additional ventilation due to the presence of a propane cylinder in the below-grade space.

**Cost Impact**: Will not increase the cost of construction

This proposal will not increase cost of construction as it removes a limitation where mobile equipment that is powered by LP gas can be used.

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**Public Hearing Results**

**Committee Action**: Disapproved

**Committee Reason**: There was concern related to the hazard presented by the use of LPG in a basement with the deletion of this prohibition.

**Assembly Action**: None

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**Individual Consideration Agenda**

**Public Comment 1**:

**Proponent**: Bruce Swiecicki, National Propane Gas Association, representing National Propane Gas Association (bswiecicki@npga.org) requests Approve as Modified by this Public Comment.

Replace Proposal as Follows:

2015 International Fire Code

6103.2.1.1 Use in basement, pit or similar location. LP-gas containers shall not be used in a basement, pit or similar location where heavier-than-air gas might collect. LP-gas containers shall not be used in an above-grade underfloor space or
basement unless such location is provided with an approved means of ventilation.

**Exception:** Use with self-contained torch assemblies in accordance with Section 6103.2.1.6.

**Exception:** The use of self-contained torch assemblies in accordance with Section 6103.2.1.6, forklift trucks and floor maintenance machines shall be permitted.

**Commenter's Reason:** LP-gas powered forklifts, man-lifts, floor buffers, and other equipment have been used successfully inside commercial and industrial occupancies for many years. This equipment can be powered by a 20 lb. or 33 lb. DOT cylinder that is subject to strict maintenance and filling requirements. There is no valid reason to prohibit the use of such equipment in basements or below grade spaces that are properly ventilated, as required by this section.
Proposed Change as Submitted

Proponent: Bruce Swiecicki, representing National Propane Gas Association (bswiecicki@npga.org)

2015 International Fire Code

SECTION 6110 LP-GAS CONTAINERS NOT IN SERVICE

Revise as follows:

6110.1 Temporarily out of service. LP-gas containers at consumer sites whose use has been temporarily discontinued shall comply with all of the following:

1. Be disconnected from appliance piping.
2. Have LP-gas container outlets, except relief valves, closed or plugged.
3. Be positioned with the relief valve in direct communication with the LP-gas container vapor space.
4. When service is reinstated, a leak check shall be performed in accordance with the fuel gas code.

6110.2 Permanently out of service. LP-gas containers at consumer sites to be placed permanently out of service shall be removed from the site.

Reason: The proposed modifications to 6110.1 are needed for the following reasons:

1. Piping should not be disconnected from the container because that allows water and air to enter the piping system, leading to corrosion and difficulties in starting the system up at a later date. In addition, the LP-gas supplier does not necessarily know when a system has been taken out of service because the homeowner only has to turn the valve to shut off service, so the requirement itself is not enforceable. The party most likely to be turning the system off is the homeowner, and under no circumstances should the code be encouraging a homeowner to perform such work on the fuel gas system.

2. The proposed addition to require a leak check to be performed on the system is necessary whenever there is an interruption in service, such as would occur when the service valve on the container is shut off. The leak check is required by the International Fuel Gas Code.

The change to 6110.2 is proposed because it is necessary to limit this requirement to consumer sites where tanks are installed. This requirement should not be misconstrued to apply to propane bulk plants because those locations are intended to store containers that have been removed from service.

Cost Impact: Will not increase the cost of construction

This proposal will not increase the cost of construction because the action of taking a LP-gas container out of service occurs after the building has been constructed and commissioned. In other words, the requirement contained in 6110.1 is not related to the construction of the building.

Committee Reason: This proposal was disapproved as the proposed language did not provide specific direction on compliance. There was only a general reference made to the fuel gas code. In addition the new language would be limited in application to consumer sites.

Committee Action: None

Public Hearing Results

Public Comment 1:

Proponent: Bruce Swiecicki, representing National Propane Gas Association (bswiecicki@npga.org) requests Approve as Modified by this Public Comment.

Replace Proposal as Follows:

2015 International Fire Code
6110.1 Temporarily out of service. Installed LP-gas containers whose use has been temporarily discontinued shall comply with all of the following:

1. Be disconnected from appliance piping.
2. Have LP-gas container outlets, except relief valves, closed and plugged or plugged capped.
3. Be positioned with the relief valve in direct communication with the LP-gas container vapor space.

Commenter's Reason: The intent of this provision is to ensure that installed propane containers whose service has been temporarily discontinued are kept in a safe condition. The code can easily be misinterpreted to say that all containers not in service should be disconnected from the system piping, which would be an unsafe practice. Doing so could lead to corrosion, dirt, insects and other contaminants entering the piping system and creating safety issues for the appliance controls that are downstream. In addition, the code is modified to require plugging container outlets or capping them in addition to closing them. Containers that are permanently removed from service are required by 6110.2 to be removed from the site.

F399-16
**Proposed Change as Submitted**

**Proponent**: Joseph Hetzel, representing Door & Access Systems Manufacturers Association (Jhetzel@thomasamc.com)

**2015 International Fire Code**

Revise as follows:

**D103.5 Fire apparatus access road gates.** Gates securing the fire apparatus access roads shall comply with all of the following criteria:

1. Where a single gate is provided, the gate width shall be not less than 20 feet (6096 mm). Where a fire apparatus road consists of a divided roadway, the gate width shall be not less than 12 feet (3658 mm).
2. Gates shall be of the swinging or sliding type.
3. Gates shall be of the horizontal swing, horizontal slide, vertical lift or vertical pivot type.
4. Construction of gates shall be of materials that allow manual operation by one person.
5. Gate components shall be maintained in an operative condition at all times and replaced or repaired when defective.
6. Electric gates shall be equipped with a means of opening the gate by fire department personnel for emergency access. Emergency opening devices shall be approved by the fire code official.
7. Methods of locking shall be submitted for approval by the fire code official.
8. Electric gate operators, where provided, shall be listed in accordance with UL 325.
9. Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F 2200.

**Reason:**

- Vertical lift gates and vertical pivot gates should be included in the criteria provision involving acceptable gate types because such gates can comply with the criteria in D103.5 including being covered in and being able to comply with UL 325 and ASTM F2200.
- Vertical lift gates can be designed to meet required minimum height clearances above roadways.
- The swinging and sliding gate type terminology has been revised to reflect terminology used in ASTM F2200.

**Cost Impact:** Will not increase the cost of construction

The proposal is intended to clarify gate types and has no bearing on construction cost.

**Committee Action:** Disapproved

**Committee Reason:** This proposal was disapproved based upon a concern with how power loss would be addressed for vertical lift gates.

**Assembly Action:** None

**Public Hearing Results**

**Individual Consideration Agenda**

**Proponent**: Joseph Hetzel, representing Door & Access Systems Manufacturers Association (Jhetzel@thomasamc.com) requests Approve as Submitted.

**Commenter's Reason:** The Committee reason for disapproval indicated the view that vertical lift gates and vertical pivot gates cannot meet the criteria of "manual operation by one person" (D103.5, #3) and "a means of opening the gate...for emergency access" (D103.5, #5.) All vehicular gates, including swinging and sliding gates, require site training and instruction for both manual operation and electric based emergency operation, and thus compliance with the stated criteria. Further, a typical gate specification (under CSI Division 32 31 00) requires that the gate installer provide training in operation and safety of the gate. Training is needed because not only are there different methods for each gate type, but gate operator manufacturers, gate construction companies and automated gate system manufacturers may have different methods for the same gate type. Therefore, the two additional gate types should be equally acceptable with respect to the currently referenced gate types, allowing for site space conditions to dictate which gate type works best.
APPENDIX N (New)

Proposed Change as Submitted

Proponent: Marcelo Hirschler, representing GBH International (gbhint@aol.com); Michael O'Brian, representing Fire Code Action Committee (FCAC@iccsafe.org)

2015 International Fire Code

Add new text as follows:

APPENDIX N INDOOR TRADE SHOWS AND EXHIBITIONS

SECTION N101 GENERAL

N101.1 Scope Indoor trade shows and exhibitions with temporary vendor displays or booths within any indoor occupancy classification shall be in accordance with this appendix and all other applicable requirements of this code.

Compliance with this appendix is not required where Section N101.1.1 or N101.1.2 are applicable.

N101.1.1 Non sprinklered buildings. In a building that is not equipped throughout with an automatic sprinkler system, where the aggregate exhibit area is less than 1500 ft² of floor area and where both conditions apply:

1. The exhibit area does not include any covered or multi-level exhibits or booths.
2. At least two remote exits or exit access doors in compliance with Chapter 10 of this code are provided.

N101.1.2 Sprinklered buildings. In a building that is equipped throughout with an automatic sprinkler system with a minimum design density of ordinary hazard Group 1, where the aggregate exhibit area is less than 4500 ft² of floor area and where both conditions apply:

1. The exhibit area does not include any covered or multi-level exhibits or booths.
2. At least two remote exits or exit access doors in compliance with Chapter 10 of this code are provided.

N101.2 Permit required An operational permit for trade shows and exhibitions shall be required as set forth in Section 105.6.14.

N101.3 Application A permit application for a trade show or exhibition shall be submitted to the fire code official prior to the start of the event in a time frame established by the jurisdiction. The application shall include documentation that identifies all of the following:

1. The means of egress.
2. The locations and width of exits and aisles.
3. The locations of exit signs.
4. The total square footage of spaces.
5. The location and arrangement of all booths and cooking equipment.
6. The location of all fire protection equipment.
7. The type and location of any heating and electrical equipment, where applicable.
8. The location of any covered or multi-level booths.
9. Construction documents for any covered or multi-level booths.
10. The locations and quantities of any storage of highly combustible goods.
11. The location and type of any vehicle displays, where applicable.

SECTION N102 DEFINITIONS

N102.1 Definitions For the purpose of this appendix, certain terms are defined as follows:

COOKING.

Heating food products to a temperature of 145 degrees F (63 degrees C) or higher by baking, braising, boiling, frying or grilling.

COVERED BOOTH.

An exhibit that has an obstruction placed over the exhibit above floor level that resembles a roof, canopy, tent or other obstruction, other than vertical signs or banners.

MULTI-LEVEL BOOTH.

An exhibit that has a second level or tier constructed on top of the exhibit or portion of the exhibit that is accessible to the public, or includes a live load above the exhibit area floor level.
N103.1 Fire safety and evacuation plan A fire safety and evacuation plan shall be provided in accordance with Section 404.2 of this code.

Exception: where the fire code official determines that the nature of the exhibition, display or of the activities therein does not pose an increased hazard to public safety.

N103.2 Fire watch personnel Where, in the opinion of the fire code official, it is essential for public safety in a trade show or exhibition, either because of the number or persons present or because of the nature of the performance, exhibition, display or activity, the owner or owners authorized agent shall provide one or more fire watch personnel in accordance with Section 403.12.1 of this code.

N103.3 Crowd managers Where events involve a gathering of more than 1,000 people, trained crowd managers shall be provided in accordance with Section 403.12.3 of this code.

SECTION N104 INTERIOR FINISH AND DECORATIVE MATERIALS

N104.1 General Interior finish, interior trim, furniture, furnishings and decorative materials, including decorative vegetation, used in exhibition areas shall comply with the requirements of this section and Chapter 8 of this code.

N104.2 Interior wall and ceiling finish The materials used for interior wall and ceiling finish of exhibit booths, and displays in exhibition areas shall comply with one of the following:
1. Where the building is not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 the wall and ceiling finish materials are required to be Class A in accordance with Section 803 of this code
2. Where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 the wall and ceiling finish materials are required to be a minimum of Class B in accordance with Section 803 of this code.

SECTION N105 MULTI-LEVEL BOOTHS

N105.1 Construction documents Construction documents for all multi-level booths shall be stamped by a registered design professional and shall be submitted with the permit application to the fire code official or the building code official, as appropriate.

N105.2 Structural design Multi-level booths shall be designed and constructed in accordance with Chapter 16 of the International Building Code.

N105.3 Means of egress Upper levels of multi-level booths with an occupant load greater than 10 persons shall have at least two exits or exit access that are separated in accordance with Section 1007.1.1 of this code.

N105.4 Automatic sprinkler systems An approved automatic sprinkler system in accordance with Section 903.3.1.1 of this code shall be provided in multi-level booths exceeding 400 ft² in floor area per level.

N105.5 Inspection Inspection to verify that multi-level booths are constructed in accordance with the construction documents and structural design details required by this section shall be approved by the building code official.

N105.6 Fire alarm and detection Each multi-level booth with a floor area exceeding 120 ft² on any level shall be provided with an approved fire alarm system in accordance with Section 907.2 of the International Fire Code.

SECTION N106 COVERED BOOTHS

N106.1 Automatic sprinkler systems An approved automatic sprinkler system in accordance with Section 903.3.1.1 of this code shall be provided in covered booths exceeding 100 ft² in floor area per level.

N106.2 Fire alarm and detection Each covered booth with a floor area exceeding 120 ft² on any level shall be provided with an approved fire alarm system in accordance with Section 907.2 of this code.

SECTION N107 DISPLAY AND STORAGE OF HAZARDOUS AND COMBUSTIBLE MATERIALS
N107.1 Hazardous materials The display of hazardous materials shall comply with Section 314 and Chapters 50 through 67 of this code. The storage of hazardous materials in indoor trade shows and exhibition areas shall be prohibited.

N107.1.1 Display near exit The display of hazardous materials within 5 ft of an exit shall be prohibited.

N107.2 Storage of combustible materials Storage of combustible materials shall comply with Section 315 of this code.

N107.3 Vehicles The display of liquid- or gas-fueled vehicles, boats or other motor craft in indoor trade shows and exhibition areas shall comply with Section 314.4 of this code and with Sections N107.3.1 through N107.3.3.

N107.3.1 Batteries in Vehicles Vehicle batteries shall be rendered inoperable. Batteries in liquid- and gas-fueled vehicles shall be disconnected. Batteries in electric vehicles shall be rendered inoperable by the removal of fuses or other approved methods but shall not be required to be disconnected.

N107.3.2 Vehicle fuel Vehicle fuel shall comply with Sections N107.3.2.1 through N107.3.2.4.

N107.3.2.1 Fueling within the structure Vehicles shall not be fueled or defueled within the structure.

N107.3.2.2 Vehicle fuel tanks Vehicle fuel tanks shall contain no more than one quarter of the tank capacity or 5 gallons of fuel, whichever is less.

N107.3.2.3 Vehicle fuel systems Vehicle fuel systems shall be inspected for leaks prior to the vehicle being brought into the structure.

N107.3.2.4 Vehicle fuel tank openings Vehicle fuel tank openings shall be locked and sealed to prevent the escape of vapors.

N107.3.3 Obstruction by vehicles Vehicles shall not be located in such a manner that they obstruct a means of egress.

N107.3.4 Gas powered vehicles Compressed natural gas (CNG), liquefied petroleum gas (LPG) or hydrogen-powered vehicles present in indoor trade shows and exhibition areas shall comply with sections N107.2.4.1 through N107.2.4.3.

N107.3.4.1 Shut-off valves Shut-off valves shall be closed and the engine shall be operated until it stops. Valves shall remain closed until the vehicle is removed.

N107.3.4.2 Battery hot lead The hot lead of the battery shall be disconnected.

N107.3.4.3 Dual-fuel vehicles equipped to operate on gasoline Dual-fuel vehicles equipped to operate on gasoline as well as on CNG, LPG or hydrogen shall also comply with Sections 3104.18 of the International Fire Code dealing with gasoline-powered vehicles.

N107.3.5 Competitions or demonstrations Competitions or demonstrations using any type of vehicle shall comply with sections 3104.18.5 of the International Fire Code.

N107.4 Fueled equipment other than vehicles Fueled equipment other than vehicles shall comply with Sections 313 of this code.

N107.5 Liquid propane gas containers Liquid propane (LP) gas containers shall comply with Sections N107.5.1 through N107.5.5.

N107.5.1 LP-gas containers exceeding 12 pounds (5 kg) of water capacity The use of LP-gas containers exceeding 12 pounds (5 kg) of water capacity shall be prohibited.

N107.5.2 Where more than one LP-gas container is present in the same area Where more than one LP-gas container is present in the same area, the aggregate weight of all containers in the area shall not exceed 12 pounds (5 kg) of water capacity.
N107.5.3 Equipment for LP-gas containers Equipment for LP-gas containers, including tanks, piping, hoses, fittings, valves, tubing and other related components, shall be approved and shall comply with Chapter 61 of this code and with the applicable requirements of the International Fuel Gas Code.

N107.5.4 Securing of LP-gas containers Portable LP-gas containers shall be securely fastened in place to prevent unauthorized movement.

N107.5.5 Spare LP-gas containers Spare LP-gas containers not connected to an approved appliance shall be stored in a location and manner approved by the fire code official.

N107.6 Cooking and open flame devices All cooking equipment and any open flame devices shall comply with the requirements of Section 308 of this code and with Chapter 5 of the International Mechanical Code. All cooking equipment shall be separated from combustible material display or storage by a horizontal distance of no less than 5 feet.

SECTION N108 Means of Egress

N108.1 Means of egress from the indoor trade show or exhibition area Means of egress from the indoor trade show or exhibition area shall comply with Chapter 10 of this code and with Sections N108.2 through N108.3.

N108.2 Design of means of egress The design of means of egress shall take into consideration the exhibit layout and the anticipated crowd movement during the event.

N108.3 Aisles and corridors Aisles and corridors within the exhibit area shall be kept free of obstructions when the public is present. There shall be no storage of any kind in aisles or corridors within the exhibit area.

Reason: This proposed appendix is intended to address hazards associated with larger, more complex trade shows and exhibitions. Although many of these requirements are already included in various locations in the IFC, some of the more important items, such as requirements for covered booths and multi-story booths are not in the existing code. In addition, having the requirements covering these events in a single location, with pointers to other locations within the IFC, makes it easier for those organizing exhibitions, and individual exhibitors who are unfamiliar with the entire fire code to locate the requirements that are applicable to them.

N101.1 The minimum square foot thresholds clarify that the appendix does not cover small trade shows, like those with traditional tabletop displays and small booths. It only covers the larger exhibitions, and those with covered and multi-level booths, which pose additional safety concerns.

N101.3 clearly defines the information needed to obtain a permit for one of these larger exhibitions. Having this information in writing makes it easier for all parties to understand the information needed to gain approval for the exhibition.

N103 includes a convenient pointer to public safety related requirements in Chapter 4 of the IFC.

N104 includes a set of interior finish requirements that are applicable to an event in a Group A occupancy where there is a significant amount of combustible material in the exhibits and booth themselves that was not present in the building when it was initially designed. Due to the potential fuel loading in the exhibition area, interior wall and ceiling finish materials are required hereby to meet Class A in unsprinklered buildings and Class B in sprinklered buildings. Other applicable requirements in Chapter 8 are not provided in this section.

N105 and N106 include specific added requirements designed to provide an acceptable level of safety for the hazards associated with multi-level and covered booths. Both of these booth types have the ability to block sprinkler protection provided in the compartment in which the exhibition is held, and also can include a significant amount of fuel loading, which justifies the requirement for temporary automatic sprinklers for the larger booths. In addition multi-level booths present concerns with structural integrity, which warrants them being designed and constructed in accordance with Chapter 16 of the IBC.

N107 includes basic requirements for display and storage in exhibitions, with emphasis on vehicles also.

N108 includes a pointer to Chapter 10 means of egress requirements, and also restricts storage in aisles and corridors of exhibitions when the general public is present.

This proposal is similar to one submitted last cycle in an attempt to simplify a reasonable set of requirements for ensuring safety at trade shows and exhibitions. Similar sets of requirements have been successfully used in jurisdictions such as Phoenix and Las Vegas. Concerns were raised last cycle about a lack of definitions, a lack of minimum thresholds, a belief that the proposal was not yet ready for inclusion in the code, and might be better suited as an adoptable appendix.

This proposal addresses many concerns raised by the Fire Code Technical Committee in its reason statement, for disapproval as follows. The proposal proposes an adoptable Appendix N, with more realistic thresholds and with a scope limited to exhibition areas over 1500 sq. ft. in unsprinklered buildings, and 3000 sq. ft. in sprinklered buildings. Exhibits including covered and multi-level booth are covered by these requirements regardless of size due to their unique safety concerns.
Committee Action: Approved as Submitted

Committee Reason: This proposal was approved as it provides a tool to address trade shows and exhibits. This information was seen as necessary as it is not found elsewhere. There were some concerns related to vehicles and LPG that should be addressed in public comment.

Assembly Action: None

Public Hearing Results

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brien (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Fire Code

N101.3 Application A permit application for a trade show or exhibition shall be submitted to the fire code official prior to the start of the event in a time frame established by the jurisdiction. The application shall include documentation that identifies all of the following:

1. The means of egress.
2. The locations and width of exits and aisles.
3. The locations of exit signs.
4. The total square footage of spaces.
5. The location and arrangement of all booths and cooking equipment.
6. The location of all fire protection equipment.
7. The type and location of any heating and electrical equipment, where applicable.
8. The location of any covered or multi-level booths.
9. Construction documents for any covered or multi-level booths.
10. The locations and quantities of any storage of highly combustible goods.
11. The location and type of any vehicle displays, where applicable.

N105.4 Automatic sprinkler systems Where required by the fire code official, An approved automatic sprinkler system in accordance with Section 903.3.1.1 of this code shall be provided in multi-level booths exceeding 400 ft² in floor area per level.

N105.6 Fire alarm and detection Where required by the fire code official, Each multi-level booth with a floor area exceeding 120 ft² on any level shall be provided with an approved fire alarm system in accordance with Section 907.2 of the International Fire Code.

N106.1 Automatic sprinkler systems Where required by the fire code official, An approved automatic sprinkler system in accordance with Section 903.3.1.1 of this code shall be provided in covered booths exceeding 100 ft² in floor area per level.

N106.2 Fire alarm and detection Where required by the fire code official, Each covered booth with a floor area exceeding 120 ft² on any level shall be provided with an approved fire alarm system in accordance with Section 907.2 of this code.

N107.3.4.2 Battery hot lead The hot lead of the battery shall be disconnected.

N107.5 Liquid propane gas containers Liquid propane (LP) gas containers shall comply with Sections N107.5.1 through N107.5.5.
N107.5.2 Where more than one LP-gas container is present in the same area - LP-Gas Container Separation.

Where more than one LP-gas container is present in the same area, the aggregate weight of all containers in the area shall not exceed 12 pounds (5 kg) of water capacity.

Commenter's Reason: These public comments address the concerns expressed by the Committee at the Committee Action Hearings that the Committee requested by addressed by Public Comment. This included minor technical corrections to N101.3; N107.5 and N107.5.2; deletion of section N107.3.4.2 as duplication of section N107.3.1 Also added "When required by the fire code official" to the requirement for temporary fire detection and/or fire sprinkler in covered booths and multi-level booths. This allows the local fire code official to determine necessity and feasibility based on the event and other local conditions.
Proposed Change as Submitted

Proponent: Mike Halligan, Halligan Group/Booster Fuels, representing Halligan Group/Booster Fuels
(mikeh@halligangroup.org)

2015 International Fire Code

Add new text as follows:

APPENDIX N  MOBILE FUELING USING CLASS 1 FUELS

SECTION N101  GENERAL

N101.1 Mobile fueling criteria. Mobile Fueling using Class 1 fuel shall be in accordance with all of the following:

1. All drivers are trained on how to respond to a fuel spill, carryout appropriate mitigation measures, and how to properly dispose of contaminated materials when necessary.
2. The tank vehicle will comply with the requirements of NFPA 385 and Local, State and Federal requirements. The tank vehicle's specific function shall be that of supplying fuel to motor vehicle fuel tanks. The tank vehicle and its equipment shall be maintained in good repair.
3. Signs prohibiting smoking or open flames with 25 feet (7.62m) of the tank vehicle or the point of fueling shall be prominently posted on 3 sides of the vehicle including the back and both sides.
4. A fire extinguisher with a minimum rating of 40:BC shall be provided on the vehicle with signage clearly indicating its location.
5. The dispersing nozzles and hoses are approved and listed for use with Class 1 fuel.
6. The dispersing hose will not be more than 50 feet (15.24m) in length.
7. Absorbent materials, non-water absorbent pads, a 10-foot (3.048m) long containment boom, an approved container with lid, and a non-metallic shovel will be on every Booster Fuel delivery vehicle to mitigate a 5 gallon fuel spill.
8. Tank dispensing pumps will be equipped with a dead man nozzle or a fuel limiter switch set to 30 gallons.
9. Staff responsible for dispensing operations is trained in the appropriate mitigating actions in the event of a fire, leak, or spill. Training records shall be maintained and available to the Code Official upon request.
10. Operators of vehicles used for mobile fueling operations will have in their possession at all times a cell phone to notify the proper authorities in the event of an emergency.
11. The tank vehicle dispensing equipment shall be constantly attended and operated only by designated personnel who are trained to handle and dispense motor fuels.
12. Prior to beginning dispensing operations, precautions shall be taken to assure ignition sources are not present.
13. The engines of vehicles being fueled and the fuel supply vehicle shall be shut off during dispensing operations.
14. The tank vehicle shall be positioned with respect to vehicles being fueled so as to preclude traffic from driving over the delivery hose and between the tank vehicle and the motor vehicle being fueled.
15. During fueling operations, the tank vehicle break shall be set and warning lights shall be in operation.
16. Motor vehicle fuel tanks shall not be topped off.
17. The dispersing hose will be mounted and stored on an approved reel prior to moving the tank vehicle.
18. Should there be an unauthorized discharge or spill, the Fire Code Official will be notified.
19. Mobile fueling of Class I fuels shall only operate in surface parking lots of locations that contract for this service. Each surface parking lot site will have a site plan submitted to the fire department. The site plan identifies:
   1. All buildings, structures, and appurtenances on site and their uses;
   2. All uses adjacent to the property lines of the site;
   3. The locations of all storm drain openings, adjacent waterways or wetlands;
   4. Information regarding slope, natural drainage, curbing, impounding and how a spill will be retained upon the site property.
20. The Code Official is authorized to impose limits upon: the times and/or days during which mobile fueling operations are allowed to take place, and specific locations on a site where fueling is permitted. Mobile fuelers will limit operations to surface parking lots of commercial, industrial, governmental, manufacturing locations and other locations as approved by the local code official. Parking garages will not be eligible for service. Operations will not be conducted inside buildings or in Educational or Institutional Occupancies as defined by the IFC.
21. Mobile fueling operations will not be conducted on public streets.
22. Mobile fueling will not take place within 15 feet (4.572m) of buildings, property lines, or combustible storage.

Reason: This Appendix Proposal for Mobile Fueling with Class I fuels is the result of two companies recognizing the need for regulation because of many other smaller companies not following safe operation procedures. Booster Fuels and WeFuel are
working together to ensure this new service moves ahead with specific conditions that will apply to mobile fueling processes as advocated by a "mobile fueling coalition".

**Statement of Intent**

This amendment is proposed by to establish minimum safety requirements. Periodically, technology progresses faster than the regulatory scheme resulting in a need for the industry to establish minimum safeguards to protect itself. This is not intended to replace the process but rather to close the gap as quickly as possible. The intent of creating this coalition is to aid local, regional and state authorities in assessing minimum safety requirements. The intent of this coalition therefore is limited to the subject of the transfer of Class 1 flammable liquids. Failure to act in an appropriate fashion encourages non conformance and could result in an incident embarrassing to both the AHJ and industry representatives.

**Current Local Fire Service**

Local governments are reluctant to take action or grant equivalency in the field of mobile fueling because the code currently provides no guidance as to how to do that. This reluctance to act translates into resistance to an emerging technology. As a result, the business community is moving forward with the adoption of practices that may or may not be appropriate.

**Points of Contact**

Ronny J. Coleman  
Fireforceone  
916-799-5363  
8866 Saint Anthony Ct  
Elk Grove CA 95624

Michael Halligan  
Halligan Fire and Life Safety  
(801) 541-3482  
7990 South Oakledge Rd  
Cottonwood Heights UT 84121

**Cost Impact:** Will not increase the cost of construction  
This proposal does not increase the cost to a jurisdiction. All costs are recovered through permit fees in each jurisdiction.

**Public Hearing Results**

**Committee Action:** Disapproved  
**Committee Reason:** This proposal was disapproved with several concerns. First, a location for such operations was not specified. Additionally, provisions should provide a requirement for a permit so that the fire code official would be aware of the operations. Also, the verbiage should be consistent with typical code language with use of the term "shall" versus "will."

**Assembly Action:** None

**Individual Consideration Agenda**

**Public Comment 1:**

Proponent : Andrew Klein, Energy Code Specialist, A S Klein Engineering, PLLC, representing Booster Fuels (andrew@asklein.com) requests Approve as Modified by this Public Comment.

Replace Proposal as follows:

**2015 International Fire Code**

**APPENDIX N ON-DEMAND MOBILE FUELING OPERATIONS**

**N101.1 General,** On-demand mobile fueling operations that dispense Class I, II, and III liquids into the fuel tanks of motor
vehicles shall comply with Sections N101.1 through N101.6.3.

**Exception:** Fueling from an approved portable container in cases of an emergency or for personal use.

**N101.1 Approval required.** Mobile fueling operations shall not be conducted without first obtaining a permit and approval from the fire code official. Mobile fueling operations shall occur only at approved locations.

**N101.2 Mobile fueling vehicle.** An on-demand mobile fueling vehicle shall be one of the following:

1. A vehicle that has chassis-mounted tanks or containers where the aggregate cargo capacity does not exceed 1200 gallons (4592 L). A mobile fueling vehicle with a mounted tank in excess of 110 gallons (415 L) shall comply with the requirements of Section 5706.6, this Appendix, and NFPA 385.

2. A vehicle that carries a maximum of 60 gallons (227 L) of motor fuel in metal safety cans listed in accordance with UL 30 or other approved metal containers each not to exceed 5 gallons (19 L) in capacity. Containers shall be secured to the mobile fueling vehicle except when in use.

The mobile fueling vehicle shall comply with the requirements of all local, state and federal requirements. The mobile fueling vehicle and its equipment shall be maintained in good repair.

**N101.3 Required documents.** Documents developed to comply with Sections N101.3.1 through N101.3.3 shall be updated as necessary by the owner of the mobile fueling operation and shall be maintained in compliance with Section 107.3.

**N101.3.1 Safety and emergency response plan.** Mobile fueling operators shall have an approved written safety and emergency response plan that establishes policies and procedures for fire safety, spill prevention and control, personnel training and compliance with other applicable requirements of this code.

**N101.3.2 Training records.** Mobile fueling vehicles shall be operated only by designated personnel who are trained on proper fueling procedures and the safety and emergency response plan. Training records of operators shall be maintained.

**N101.3.3 Site plan.** Where required by the fire code official, a site plan shall be developed for each location at which mobile fueling occurs. The site plan shall be in sufficient detail to indicate: all buildings, structures, lot lines, property lines, and appurtenances on site and their use or function; all uses adjacent to the lot lines of the site; fueling locations, the locations of all storm drain openings, and adjacent waterways or wetlands; information regarding slope, natural drainage, curbing, impounding and how a spill will be retained upon the site property; and the scale of the site plan.

**N101.4 Mobile fueling areas.** Mobile fueling shall not occur on public streets, public ways, or inside buildings. Fueling on the roof level of parking structures or other buildings is prohibited.

**N101.4.1 Separation.** Mobile fueling shall not take place within 25 feet (7620 mm) of buildings, property lines, or combustible storage.

**Exception:** The fire code official shall be authorized to decrease the separation distance for dispensing from metal safety cans or other approved metal containers in accordance with Section N101.2.

When dispensing operations occur within 15 feet (4572 mm) of a storm drain, an approved storm drain cover or an approved equivalent method that will prevent any fuel from reaching the drain shall be used.

**N101.4.2 Sources of ignition.** Smoking, open flames, and other sources of ignition shall be prohibited within 25 feet (7620 mm) of fuel dispensing activities. Signs prohibiting smoking or open flames within 25 feet (7620 mm) of the vehicle or the point of fueling shall be prominently posted on the mobile fueling vehicle. The engines of vehicles being fueled shall be shut off during fueling.

**N101.5 Equipment.** Mobile fueling equipment shall comply with Sections N101.5.1 through N101.5.4.

**N101.5.1 Dispensing hoses and nozzles.** Where equipped, the dispensing hose shall not exceed 50 feet (15 240 mm) in length. The dispensing nozzles and hoses shall be of an approved and listed type.

**N101.5.2 Fuel limit.** Mobile fueling vehicles shall be equipped with a fuel limit switch set to a maximum of 30 gallons (116 L) and a nozzle or other approved device that, when activated, immediately causes flow of fuel from the mobile fueling vehicle to cease.

**N101.5.3 Fire extinguisher.** An approved portable fire extinguisher complying with Section 906 with a minimum rating of 40-B:C shall be provided on the mobile fueling vehicle with signage clearly indicating its location.

**N101.5.4 Spill kit.** Mobile fueling vehicles shall contain a minimum 5 gallon (19 L) spill kit of an approved type.

**N101.6 Operations.** Mobile fueling vehicles shall be constantly attended during fueling operations with brakes set and warning lights in operation. Mobile fueling vehicles shall not obstruct emergency vehicle access roads.

**N101.6.1 Dispensing hose.** Where equipped, mobile fueling vehicles shall be positioned in a manner to preclude traffic from driving over the dispensing hose. The dispensing hose shall be properly placed on an approved reel or in an approved compartment prior to moving the mobile fueling vehicle.
**N101.6.2 Drip control.** Operators shall place a drip pan or an absorbent pillow under the nozzle to catch drips and under each fuel fill opening prior to and during dispensing operations.

**N101.6.3 Spill reporting.** Spills shall be reported in accordance with Section 5003.3.1.

**Commenter's Reason:** This Public Comment is designed to provide jurisdictions the option to regulate on-demand mobile fueling operations through adoption of this appendix. This Public Comment provides a code compliant path for fire code officials to authorize and regulate on-demand mobile fueling operations, vehicles, and equipment. The current requirements for mobile fleet fueling, where tank vehicles in excess of 1200 gallons are typically used, remain unchanged. On-demand mobile fueling is an emerging industry that has had significant consumer demand both nationally and internationally. The practice is already occurring—both regulated and unregulated—and codification in the national code is imperative to ensure safe, consistent regulation of the operation.

This Public Comment was developed in conjunction with the California State Fire Marshal's Office Mobile Fueling Task Force - IFC Subgroup, comprised of fire code officials, industry stakeholders, and interested parties.